

1. **Scope.** Except as otherwise specifically provided, these regulations apply to all persons who receive, possess, use,

## PART A GENERAL PROVISIONS

SUBJECT: STATE OF MAINE  
REGULATIONS

transfer, own or acquire any source of radiation; provided, however that nothing in these regulations shall apply to any person to the extent such person is subject to regulation by the U.S. Nuclear Regulatory Commission.<sup>1/</sup>

### 2. Definitions.

A. As used in these regulations, these terms have the definitions set forth below. Additional definitions used only in a certain part will be found in that part.

- (1) "**Absorbed dose**" means the energy imparted by ionizing radiation per unit mass of irradiated material. The units of absorbed dose are the Gray (Gy) and the rad.
- (2) "**Accelerator**" means any machine capable of accelerating electrons, protons, deuterons, or other charged particles in a vacuum and of discharging the resultant particulate or other radiation into a medium at energies usually in excess of 1 MeV.
- (3) "**Accelerator-produced material**" means any material made radioactive by a particle accelerator. See Appendix B of Part C.
- (4) "**Act**" means 22 MRSA c. 160.
- (5) "**Activity**" means the rate of disintegration or transformation or decay of radioactive material. The units of activity are the becquerel (Bq) and the curie (Ci).
- (6) "**Adult**" means an individual 18 or more years of age.
- (7) "**Agency**" means Department of Human Services.
- (8) "**Agreement state**" means any State with which the U.S. Nuclear Regulatory Commission or the U.S. Atomic Energy Commission has entered into effective agreement under subsection 274b. of the Atomic Energy Act of 1954, as amended (73 Stat. 689).
- (9) "**Airborne radioactive material**" means any radioactive material dispersed in the air in the form of particulates, dusts, fumes, mists, vapors, or gases.
- (10) "**Airborne radioactivity area**" means a room, enclosure, or area in which airborne radioactive materials exist in concentrations:
  - (a) In excess of the derived air concentrations (DACs) specified in Appendix B, Table I of Part D of these regulations, or
  - (b) To such a degree that an individual present in the area without respiratory protective equipment could exceed, during the hours an individual is present in a week, an intake of 0.6 percent of the annual limit on intake (ALI) or 12 DAC-hours.
- (11) "**Air-purifying respirator**" means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

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<sup>1/</sup> Attention is directed to the fact that regulation by the State of source material, byproduct material, and special nuclear material in quantities not sufficient to form a critical mass is subject to the provisions of the agreement between the State and the U.S. Nuclear Regulatory Commission and to 10 CFR Part 150 of the Commission's regulations.

<sup>(12)</sup> **Alert** means events may occur, are in progress, or have occurred that could lead to a release of radioactive material but that the release is not expected to require a response by offsite response organizations to protect persons offsite.

- (13) "**As low as is reasonably achievable**" (ALARA) means making every reasonable effort to maintain exposures to radiation as far below the dose limits in these regulations as is practical, consistent with the purpose for which the licensed or registered activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed or registered sources of radiation in the public interest.
- (14) "**Assigned Protection Factor (APF)**" means the expected workplace level of respiratory protection that would be provided by a properly functioning respirator or a class of respirators to properly trained and fitted users. Operationally, the inhaled concentration can be estimated by dividing the ambient airborne concentration by the APF.
- (15) "**Atmosphere-supplying respirator**" means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SAR's) and self-contained breathing apparatus (SCBA) units.
- (16) "**Atomic energy**" means all forms of energy released in the course of nuclear fission or nuclear transformation.
- (17) "**Background radiation**" means radiation from cosmic sources; naturally occurring radioactive materials, including radon, except as a decay product of source or special nuclear material, and including global fallout as it exists in the environment from the testing of nuclear explosive devices. "Background radiation" does not include sources of radiation from radioactive materials regulated by the Agency.
- (18) "**Becquerel**" (Bq) means the SI unit of activity. One becquerel is equal to 1 disintegration or transformation per second (dps or tps).
- (19) "**Bioassay**" means the determination of kinds, quantities or concentrations, and, in some cases, the locations of radioactive material in the human body, whether by direct measurement, in vivo counting, or by analysis and evaluation of materials excreted or removed from the human body. For purposes of these regulations, "radiobioassay" is an equivalent term.
- (20) "**Brachytherapy**" means a method of radiation therapy in which sealed sources are utilized to deliver a radiation dose at a distance of up to a few centimeters, by surface, intracavitary, or interstitial application.
- (21) "**Byproduct material**" means (a) any radioactive material, except special nuclear material, yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material, (b) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition.
- (22) "**Calendar quarter**" means not less than 12 consecutive weeks or more than 14 consecutive weeks. The first calendar quarter of each year shall begin in January and subsequent calendar quarters shall be so arranged such that no day is included in more than one calendar quarter and no day in any one year is omitted from inclusion within a calendar quarter. No licensee or registrant shall change the method observed by him of determining calendar quarters for purposes of these regulations except at the beginning of a year.
- (23) "**Calibration**" means the determination of (a) the response or reading of an instrument relative to a series of known radiation values over the range of the instrument, or (b) the strength of a source of radiation relative to a standard.
- (24) "**CFR**" means Code of Federal Regulations.
- (25) "**Chelating agent**" means amine polycarboxylic acids, hydroxy-carboxylic acids, gluconic acid, and polycarboxylic acids.

- (26) "**Collective dose**" means the sum of the individual doses received in a given period of time by a specified population from exposure to a specified source of radiation.
- (27) "**Commencement of construction**" means any clearing of land, excavation, or other substantial action that would adversely affect the natural environment of a site but does not include changes desirable for the temporary use of the land for public recreational uses, necessary borings to determine site characteristics or other preconstruction monitoring to establish background information related to the suitability of a site or to the protection of environmental values.

- (28) "**Committed dose equivalent**" ( $H_{T,50}$ ) 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.
- (29) "**Committed effective dose equivalent**" ( $H_{E,50}$ ) is the sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to each of these organs or tissues ( $H_{E,50} = \sum w_T H_{T50}$ ).
- (30) "**Controlled area**" means an area, outside of a restricted area but inside the site boundary, access to which can be limited by the licensee or registrant for any reason
- (31) "**Critical Group**" means the group of individuals reasonably expected to receive the greatest exposure to residual radioactivity for any applicable set of circumstances.
- (32) "**Curie**" means a unit of quantity of radioactivity. One curie (Ci) is that quantity of radioactive material, which decays at the rate of  $3.7 \times 10^{10}$  transformations per second (tps). Commonly used submultiples of the curie are the millicurie and the microcurie. One millicurie (mCi) = 0.0001 curie =  $3.7 \times 10^7$  tps. One microcurie ( $\mu$ Ci) = 0.000001 curie =  $3.7 \times 10^4$  tps.
- (33) "**Deep-dose equivalent**" ( $H_d$ ), which applies to external whole body exposure, means the dose equivalent at a tissue depth of 1 centimeter ( $1000 \text{ mg/cm}^2$ ).
- (34) "**Demand respirator**" means an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.
- (35) "**Decommission**" means to remove (as a facility) safely from service and reduce residual radioactivity to a level that permits release of the property for unrestricted use and termination of the license.
- (36) "**Depleted uranium**" means the source material uranium in which the isotope uranium-235 is less than 0.711 weight percent of the total uranium present. Depleted uranium does not include special nuclear material.
- (37) "**Dentist**" means an individual duly registered and licensed to practice dentistry or dental surgery or any branch thereof under 32 MRSA §1082.
- (38) "**Disposable respirator**" means a respirator for which maintenance is not intended and that is designed to be discarded after excessive breathing resistance, sorbent exhaustion, physical damage, or end-of-service-life renders it unsuitable for use. Examples of this type of respirator are a disposable half-mask respirator or a disposable escape-only self-contained breathing apparatus (SCBA).
- (39) "**Distinguishable from Background**" means that the detectable concentration of a radionuclide is statistically different from the background concentration of that radionuclide in the vicinity of the site or, in the case of structures, in similar materials using adequate measurement technology, survey, and statistical techniques.
- (40) "**Dose**" is a generic term that means absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, total organ dose equivalent, or total effective dose equivalent. For purposes of these regulations, "radiation dose" is an equivalent term.
- (41) "**Dose equivalent( $H_T$ )**" means the product of the absorbed dose in tissue, quality factor, and all other necessary modifying factors at the location of interest. The units of dose equivalent are the sievert (Sv) and the rem.
- (42) "**Dose limits**" means the permissible upper bounds of radiation doses established in accordance with these regulations. For purposes of these regulations, "limits" is an equivalent term.

- (43) **“Effective dose equivalent ( $H_E$ )”** means the sum of the products of the dose equivalent to each organ or tissue ( $H_T$ ) and the weighting factor ( $w_T$ ) applicable to each of the body organs or tissues that are irradiated ( $H_E = \sum w_T H_T$ ).
- (44) **“Effective kilogram”** means (1) for the source material uranium in which the uranium isotope uranium - 235 is greater than 0.005 (0.5 weight percent) of the total uranium present: 10,000 kilograms, and (2) for any other source material: 20,000 kilograms.

- (45) "**Effective kilograms of special nuclear material**" means: (1) For plutonium and uranium-233 their weight in kilograms; (2) For uranium with an enrichment in the isotope U-235 of 0.01 (1%) and above, its element weight in kilograms multiplied by the square of its enrichment expressed as a decimal weight fraction; and (3) For uranium with an enrichment in the isotope U-235 below 0.01 (1%), by its element weight in kilograms multiplied by 0.0001.
- (46) "**Embryo/fetus**" means the developing human organism from conception until the time of birth.
- (47) "**Entrance or access point**" means any opening through which an individual or extremity of an individual could gain access to radiation areas or to licensed or registered radioactive materials. This includes entry or exit portals of sufficient size to permit human entry, irrespective of their intended use.
- (48) "**Explosive material**" means any chemical compound, mixture, or device, which produces a substantial instantaneous release of gas and heat spontaneously or by contact with, sparks or flame.
- (49) "**Exposure**" means being exposed to ionizing radiation or to radioactive material.
- (50) "**Exposure**" means the quotient of  $dQ$  by  $dm$  where " $dQ$ " is the absolute value of the total charge of the ions of one sign produced in air when all the electrons (negatrons and positrons) liberated by photons in a volume element of air having mass " $dm$ " are completely stopped in air. The units of exposure are the coulomb per kilogram (C/kg) and the roentgen (R).
- (51) "**Exposure rate**" means the exposure per unit of time, such as roentgen per minute and milliroentgen per hour.
- (52) "**External dose**" means that portion of the dose equivalent received from any source of radiation outside the body.
- (53) "**Extremity**" means hand, elbow, and arm below the elbow, foot, knee, and leg below the knee.
- (54) "**Filtering facepiece (dust mask)**" means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.
- (55) "**Fit factor**" means a quantitative estimate of the fit of a particular respirator to a specific individual and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.
- (56) "**Fit Test**" means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual.
- (57) "**Former U.S. Atomic Energy Commission (AEC) or U.S. Nuclear Regulatory Commission (NRC) licensed facilities**" means nuclear reactors, nuclear fuel reprocessing plants, uranium enrichment plants, or critical mass experimental facilities where AEC or NRC licenses have been terminated.
- (58) "**Formula quantity**" means strategic special nuclear material in any combination in a quantity of 5000 grams or more computed by the formula,  $\text{grams} = (\text{grams contained U - 235}) + 2.5 (\text{grams U - 233} + \text{grams plutonium})$ . This class of material is sometimes referred to as a Category I quantity of material.
- (59) "**Generally applicable environmental radiation standards**" means standards issued by the U.S. Environmental Protection Agency (EPA) under the authority of the Atomic Energy Act of 1954, as amended, that impose limits on radiation exposures or levels, or concentrations or quantities of radioactive material, in the general environment outside the boundaries of locations under the control of persons possessing or using radioactive material.

- (60) "**Gray**" means the SI unit of absorbed dose. One gray (Gy) is equal to an absorbed dose of 1 joule per kilogram (100 rad).
- (61) "**Hazardous waste**" means those wastes designated as hazardous by the U.S. Environmental Protection Agency regulations in 40 CFR Part 261.
- (62) "**Healing arts**" means any discipline which involves the diagnosis or treatment of individuals by a practitioner who is licensed for that purpose by the State of Maine, and which discipline, prior to the effective date of these regulations, included the intentional exposure of individuals to sources of radiation for diagnosis or treatment.

- (63) "**Helmet**" means a rigid respiratory inlet covering that also provides head protection against impact and penetration.
- (64) "**High radiation area**" means an area, accessible to individuals, in which radiation levels from radiation sources external to the body 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 30 centimeters from any surface that the radiation penetrates.
- (65) "**Hood**" means a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.
- (66) "**Human use**" means the internal or external administration of radiation or radioactive material to human beings.
- (67) "**Individual**" means any human being.
- (68) "**Individual monitoring**" means the assessment of:
- (a) Dose equivalent (1) by the use of individual monitoring devices or (2) by the use of survey data; or
  - (b) Committed effective dose equivalent (1) by bioassay or (2) by determination of the time-weighted air concentrations to which an individual has been exposed, that is, DAC-hours. [See the definition of DAC-hours in Part D].
- (69) "**Individual monitoring devices**" means devices designed to be worn by a single individual for the assessment of dose equivalent. For purposes of these regulations, "personnel dosimeter" and "dosimeter" are equivalent terms. Examples of individual monitoring devices are film badges, thermoluminescent dosimeters (TLDs), pocket ionization chambers, personal air sampling devices, and optically stimulated luminescence (OSL) devices..
- (70) "**Inspection**" means an official examination or observation including but not limited to, tests, surveys, and monitoring to determine compliance with rules, regulations, orders, requirements and conditions of the Agency.
- (71) "**Interlock**" means a device arranged or connected such that the occurrence of an event or condition is required before a second event or condition can occur or continue to occur.
- (72) "**Internal dose**" means that portion of the dose equivalent received from radioactive material taken into the body.
- (73) "**Lens 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 ( $300 \text{ mg/cm}^2$ ).
- (74) "**License**" means a license issued by the Agency in accordance with the regulations adopted by the Agency.
- (75) "**Licensed [or registered] material**" means radioactive material received, possessed, used, transferred or disposed of under a general or specific license [or registration] issued by the Agency.
- (76) "**Licensee**" means any person who is licensed by the Agency in accordance with these regulations and the Act.
- (77) "**Licensing State**" means any State with regulations compatible to the Suggested State Regulations for Control of Radiation relating to, and an effective program for, the regulatory control of NARM and which has been granted final designation by the Conference of Radiation Control Program Directors, Inc.
- (78) "**Limits**" [See "Dose limits"].
- (79) "**Loose-fitting facepiece**" means a respiratory inlet covering that is designed to form a partial seal with the face.
- (80) "**Lost or missing licensed [or registered] source of radiation**" means licensed [or registered] source of radiation whose location is unknown. This definition includes licensed [or registered] material that has been shipped but has not reached its planned destination and whose location cannot be readily traced in the transportation system.



- (81) "**Major processor**" means a user processing, handling, or manufacturing radioactive material exceeding Type A quantities as unsealed sources or material, or exceeding 4 times Type B quantities as sealed sources, but does not include nuclear medicine programs, universities, industrial radiographers or small industrial programs. Type A and B quantities are defined in Section 71.4 of 10 CFR Part 71.
- (82) "**Member of the public**" means an individual in a controlled or unrestricted area. However, an individual is not a member of the public during any period in which the individual receives an occupational dose.
- (83) "**Minor**" means an individual less than 18 years of age.
- (84) "**Monitoring**" means the measurement of radiation, radioactive material concentrations, surface area activities or quantities of radioactive material and the use of the results of these measurements to evaluate potential exposures and doses. For purposes of these regulations, "radiation monitoring" and "radiation protection monitoring" are equivalent terms.
- (85) "**NARM**" means any naturally occurring or accelerator-produced radioactive material. It does not include byproduct, source, or special nuclear material. See Appendix B of Part C.
- (86) "**Natural radioactivity**" means radioactivity of naturally occurring nuclides.
- (87) "**Negative pressure respirator (tight fitting)**" means a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.
- (88) "**Nuclear Regulatory Commission**" (NRC) means the U.S. Nuclear Regulatory Commission or its duly authorized representatives.
- (89) "**Occupational dose**" means the dose received by an individual in the course of employment in which the individual's duties involve exposure to radiation or to radioactive material from licensed and unlicensed sources of radiation, whether in the possession of the licensee, registrant, or other person. Occupational dose does not include dose received: from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released in accordance with Part G, from voluntary participation in medical research programs, or as a member of the public.
- (90) "**Package**" means the packaging together with its radioactive contents as presented for transport.
- (91) "**Particle accelerator**" [see "Accelerator"].
- (92) "**Person**" means any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, agency, political subdivision of this State, any other State or political subdivision or agency thereof, and any legal successor, representative, agent or agency of the foregoing but not including Federal Government agencies.
- (93) "**Personnel monitoring equipment**" [See "Individual monitoring devices"]
- (94) "**Pharmacist**" means an individual licensed by this State to compound and dispense drugs, prescriptions, and poisons.
- (95) "**Physician**" means an individual duly registered and licensed to practice medicine or surgery or any branch thereof under 32 MRSA §3270.
- (96) "**Podiatrist**" means an individual duly registered and licensed to practice podiatry or any branch thereof under 32 MRSA §3552.
- (97) "**Positive pressure respirator**" means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

- (98) **"Powered air-purifying respirator (PAPR)"** means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.
- (99) **"Pressure demand respirator"** means a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

- (100) "**Principal activities**", as used in this part, means activities authorized by the license, which are essential to achieving the purpose(s) for which the license was issued or amended. Storage during which no licensed material is accessed for use or disposal and activities incidental to decontamination or decommissioning are not principal activities.
- (101) "**Production facility**" means production facility as defined in the regulations contained in Part C of these regulations.
- (102) "**Public dose**" means the dose received by a member of the public from exposure to sources of radiation either within a licensee's or registrant's controlled area or in unrestricted areas. It does not include occupational dose, dose received from background radiation, dose received as a patient from medical practices, or dose from voluntary participation in medical research programs.
- (103) "**Pyrophoric liquid**" means any liquid that ignites spontaneously in dry or moist air at or below 130 °F (54.4 °C). A pyrophoric solid is any solid material, other than one classed as an explosive, which under normal conditions is liable to cause fires through friction, retained heat from manufacturing or processing, or which can be ignited readily and, when ignited, burns so vigorously and persistently as to create a serious transportation, handling, or disposal hazard. Included are spontaneously combustible and water-reactive materials.
- (104) "**Qualified Expert**" means an individual who is either a Radiological Physicist, or an X-ray Survey Technician (see Part F.4.) and has demonstrated to the satisfaction of the Agency that such individual possesses the knowledge and training to measure ionizing radiation, to evaluate safety techniques, and advise regarding radiation protection needs. With reference to the calibration of radiation therapy equipment, an individual having, in addition to the above qualifications, training and experience in the clinical applications of radiation physics to radiation therapy.
- (105) "**Qualitative fit test (QLFT)**" means a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.
- (106) "**Quality factor**" (Q) means the modifying factor, listed in Tables I and II of A.13 that is used to derive dose equivalent from absorbed dose.
- (107) "**Quantitative fit test (QNFT)**" means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.
- (108) "**Rad**" means the special unit of absorbed dose. One rad is equal to an absorbed dose of 100 erg per gram or 0.01 joule per kilogram (0.01 Gy).
- (109) "**Radiation**" means ionizing radiation, which includes any or all of the following: gamma and x-rays, alpha and beta particles, high speed electrons, neutrons, high speed protons, and other atomic particles.
- (110) "**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 from the radiation source or from any surface that the radiation penetrates.
- (111) "**Radiation dose**" [See "Dose"].
- (112) "**Radiation machine**" means any device capable of producing radiation except those, which produce radiation only from radioactive material.
- (113) "**Radiation safety officer**" means one who has the knowledge and responsibility to apply appropriate radiation protection regulations.
- (114) "**Radioactive material**" means any solid, liquid, or gas, which emits radiation spontaneously.
- (115) "**Radioactivity**" means the transformation of unstable atomic nuclei by the emission of radiation.
- (116) "**Radiobioassay**" [See "Bioassay"].

- (117) "**Radiological Physicist**" means an individual who:
- (a) is certified by the American Board of Radiology in therapeutic radiological physics, diagnostic radiological physics, or medical nuclear physics; or
  - (b) has a bachelor's degree in one of the physical sciences or engineering and three years full-time experience working in therapeutic radiological physics under the direction of a physicist certified by the American Board of Radiology. The work duties must include duties involving the calibration and spot checks of a medical accelerator or sealed source teletherapy unit; or
  - (uuuu0 has a Master's degree or Doctorate in physics, biophysics, radiological physics, health physics, or engineering; has had 1 year's full-time training in therapeutic radiological physics; and has had 1 year's full-time work experience in a radiotherapy facility where the individual's duties involve calibration and spot checks of a medical accelerator or a sealed source teletherapy unit.
- (118) "**Registrant**" means any person who is registered with the Agency and is legally obligated to register with the Agency pursuant to these regulations and the Act.
- (119) "**Registration**" means registration with the Agency in accordance with the regulations adopted by the Agency.
- (120) "**Regulations of the U.S. Department of Transportation**" means the regulations in 49 CFR Parts 100-189.
- (121) "**REM**" means a special unit of dose equivalent. One millirem (mrem) = 0.001 rem. For the purpose of these regulations, any of the following is considered to be equivalent to a dose of one rem:
- (a) An exposure of 1 roentgen of x or gamma radiation.
  - (b) An absorbed dose of 1 rad due to x, gamma, or beta radiation.
  - (c) An absorbed dose of 0.05 rad due to particles heavier than protons and with sufficient energy to reach the lens of the eye.
  - (vvvv0 An absorbed dose of 0.1 rad due to neutrons or high energy protons; or  $2.5 \times 10^7$  neutrons/square centimeter incident upon the body; or estimating the energy distribution of the neutron flux with reasonable accuracy as indicated in table 2 of A.13.A(5).
- (122) "**Research and development**" means (a) theoretical analysis, exploration, or experimentation; or (b) the extension of investigative findings and theories of a scientific or technical nature into practical application for experimental and demonstration purposes, including the experimental production and testing of models, devices, equipment, materials, and processes. Research and development does not include the internal or external administration of radiation or radioactive material to human beings.
- (123) "**Residual radioactivity**" means radioactivity in structures, materials, soils, groundwater, and other media at a site resulting from activities under the licensee's control. This includes all radioactivity from all licensed and unlicensed sources used by the licensee, but excludes background radiation. It also includes radioactive materials remaining at the site as a result of routine or accidental releases of radioactive materials at the site and previous burials at the site, even if those burials were made in accordance with the provisions of Part D.
- (124) "**Restricted area**" means any area access to which is controlled by the licensee or registrant for purposes of protection of individuals from exposure to radiation and radioactive material. A restricted area shall not include any areas used for residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area.
- (125) "**Roentgen**" means the special unit of exposure. One roentgen (R) equals  $2.58 \times 10^{-4}$  coulombs/kilogram of air. (See "Exposure").
- (126) "**Sealed source**" means radioactive material that is permanently bonded or fixed in a capsule or matrix designed to prevent release and dispersal of the radioactive material under the most severe conditions which are likely to be encountered in normal use and handling.
- (127) "**Self-contained breathing apparatus (SCBA)**" means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.
- (128) "**Shallow dose equivalent**" ( $H_s$ ), which applies to the external exposure of the skin or an extremity, means the dose equivalent at a tissue depth of 0.007 centimeter ( $7 \text{ mg/cm}^2$ ) averaged over an area of 1 square centimeter.

- (129) "**SI**" means the abbreviation for the International System of Units.
- (130) "**Sievert**" means the SI unit of any of the quantities expressed as dose equivalent. The dose equivalent in sievert (Sv) is equal to the absorbed dose in gray multiplied by the quality factor (1 Sv = 100 rem).
- (131) "**Site area emergency**" means events may occur, are in progress, or have occurred that could lead to a significant release of radioactive material and that could require a response by offsite response organizations to protect persons offsite.
- (132) "**Site boundary**" means that line beyond which the land or property is not owned, leased, or otherwise controlled by the licensee or registrant.
- (133) "**Source material**" means
- (a) uranium or thorium, or any combination thereof, in any physical or chemical form; or
  - (b) ores, which contain by weight one-twentieth of one percent (0.05 percent) or more of
    - (i) uranium,
    - (ii) thorium, or
    - (iii) any combination thereof.
- Source material does not include special nuclear material.
- (134) "**Source material milling**" means any activity that results in the production of byproduct material as defined by definition (2) of byproduct material.
- (135) "**Source of radiation**" means any radioactive material or any device or equipment emitting, or capable of producing radiation.
- (136) "**Special form**" means radioactive material, which satisfies the following conditions:
- (a) It is either a single solid piece or is contained in a sealed capsule that can be opened only by destroying the capsule;
  - (b) The piece or capsule has at least one dimension not less than 5 millimeters (0.2 inch); and
  - (c) It satisfies the test requirements specified by the U.S. NRC. A special form encapsulation designed in accordance with the NRC requirements in effect on June 30, 1983, and constructed prior to July 1, 1985 may continue to be used. A special form encapsulation either designed or constructed after June 30, 1985 must meet requirements of this definition applicable at the time of its design or construction.
- (137) "**Special nuclear material**" means:
- (a) Plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and any other material that the Agency declares by order to be special nuclear material after <sup>2/</sup> the U.S. Nuclear Regulatory Commission, pursuant to the provisions of section 51 of the Atomic Energy Act of 1954, as amended, determines to be special nuclear material, but does not include source material; or
  - (b) Any material artificially enriched by any of the foregoing but does not include source material.
- (138) "**Special nuclear material in quantities not sufficient to form a critical mass**" means uranium enriched in the isotope U-235 in quantities not exceeding 350 grams of contained U-235; uranium-233 in quantities not exceeding 200 grams; plutonium in quantities not exceeding 200 grams; or any combination of them in accordance with the following formula: For each kind of special nuclear material, determine the ratio between the quantity of that special nuclear material and the quantity specified above for the same kind of special nuclear material. The sum of such ratios for all of the kinds of special nuclear material in combination shall not exceed "1" (i.e., unity). For example, the following quantities in combination would not exceed the limitation and are within the formula:
- $$350 \quad \frac{175(\text{grams containing U-235})}{200} + \frac{50(\text{gms U-233})}{200} + \frac{50(\text{gms Pu})}{200} = 1$$
- (139) "**Supplied-air respirator (SAR)**" or airline respirator" means an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

<sup>2/</sup> This wording is provided for states that cannot automatically adopt changes made by the Nuclear Regulatory Commission. **10-144A CMR 220 (August 1, 2001) Page A-15**

- (140) "**Survey**" means an evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, and/or presence of radiological material or other sources of radiation. When appropriate, such an evaluation includes, but is not limited to, a physical survey of the location of radioactive material and measurements or calculations of levels of radiation, or concentration or quantities of radioactive material present.
- (141) "**Test**" means the process of verifying compliance with applicable regulation.
- (142) "**These regulations**" means all parts of Maine Rules Relating to Radiation Protection 10-144A CMR 220.
- (143) "**Tight-fitting facepiece**" means a respiratory inlet covering that forms a complete seal with the face.
- (144) "**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.
- (145) "**Total organ dose equivalent**" (TODE) means the sum of the deep dose equivalent and the committed dose equivalent to the organ receiving the highest dose as described in D.46.A(6) of these regulations.
- (146) "**U.S. Department of Energy**" means the Department of Energy established by Public Law 95-91, August 4, 1977, 91 Stat. 565, 42 U.S.C. 7101 et seq., to the extent that the Department exercises functions formerly vested in the U.S. Atomic Energy Commission, its Chairman, members, officers and components and transferred to the Energy Research and Development Administration and to the Administrator thereof pursuant to sections 104(b), (c) and (d) of the Energy Reorganization Act of 1974 (Public Law 93-438, October 11, 1974, 88 Stat. 1233 at 1237, 42 U.S.C. 5814, effective January 19, 1975) and retransferred to the Secretary of Energy pursuant to section 301(a) of the Department of Energy Organization Act (Public Law 95-91, August 4, 1977, 91 Stat. 565 at 577-578, 42 U.S.C. 7151, effective October 1, 1977.)
- (147) "**Unrefined and unprocessed ore**" means ore in its natural form prior to any processing, such as grinding, roasting, beneficiating, or refining.
- (148) "**Unrestricted area**" means any area access to, which is neither limited nor controlled by the licensee or registrant. For purposes of these regulations, "uncontrolled area" is an equivalent term.
- (149) "**User seal check (fit check)**" means an action conducted by the respirator user to determine if the respirator is properly seated to the face. Examples include negative pressure check, positive pressure check, irritant smoke check, or isoamyl acetate check.
- (150) "**Waste**" means those low-level radioactive wastes that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-Level Radioactive Waste Policy Act, P.L. 96-573, as amended by P.L. 99-240, effective January 15, 1986; that is, radioactive waste (a) not classified as high-level radioactive waste, spent nuclear fuel, or byproduct material as defined in Section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste) and (b) classified as low-level radioactive waste consistent with existing law and in accordance with (a) by the U.S. Nuclear Regulatory Commission.
- (151) "**Waste handling licensees**" means persons licensed to receive and store radioactive wastes prior to disposal and/or persons licensed to dispose of radioactive waste.
- (152) "**Week**" means 7 consecutive days starting on Sunday.
- (153) "**Whole body**" means, for purposes of external exposure, head, trunk including male gonads, arms above the elbow, or legs above the knee.
- (154) "**Worker**" means an individual engaged in work under a license or registration issued by the Agency and controlled by a licensee or registrant, but does not include the licensee or registrant.
- (155) "**Working level**" (WL) means any combination of short-lived radon daughters in 1 liter of air that will result in the ultimate emission of  $1.3E+5$  MeV of potential alpha particle energy. The short-lived radon daughters are for radon-222: polonium-218, lead-214, bismuth-214, and polonium-214; and for radon-220: polonium-216, lead-212, bismuth-212, and polonium-212.
- (156) "**Working level month**" (WLM) means an exposure to 1 working level for 170 hours. 2,000 working hours per year divided by 12 months per year is approximately equal to 170 hours per month.

(157) "Year" means the period of time beginning in January used to determine compliance with the provisions of these regulations. The licensee or registrant may change the starting date of the year used to determine compliance by the licensee or registrant provided that the change is made at the beginning of the year and that no day is omitted or duplicated in consecutive years.

### 3. Exemptions.

- A. **General Provision.** The Agency may, upon application therefore or upon its own initiative, grant such exemptions or exceptions from the requirements of these regulations as it determines are authorized by law and will not result in undue hazard to public health and safety or property.
- B. **U.S Department of Energy Contractors and U.S. Nuclear Regulatory Commission Contractors.** Any U.S. Department of Energy contractor or subcontractor and any U.S. Nuclear Regulatory Commission contractor or subcontractor of the following categories operating within this State is exempt from these regulations to the extent that such contractor or subcontractor under his contract receives, possesses, uses, transfers or acquires sources of radiation:
- (1) prime contractors performing work for the U.S. Department of Energy at U.S. Government-owned or controlled sites, including the transportation of sources of radiation to or from such sites and the performance of contract services during temporary interruptions of such transportation;
  - (2) prime contractors of the U.S. Department of Energy performing research in, or development, manufacture, storage, testing or transportation of, atomic weapons or components thereof;
  - (3) prime contractors of the U.S. Department of Energy using or operating nuclear reactors or other nuclear devices in a United States Government-owned vehicle or vessel; and
  - (4) any other prime contractor or subcontractor of the U.S. Department of Energy or of the U.S. Nuclear Regulatory Commission when the State and the Nuclear Regulatory Commission jointly determine:
    - (a) that the exemption of the prime contractor or subcontractor is authorized by law; and
    - (b) that under the terms of the contract or subcontract, there is adequate assurance that the work thereunder can be accomplished without undue risk to the public health and safety.

4. **Records.** Each licensee and registrant shall maintain records showing the receipt, transfer, and disposal of all sources of radiation. Additional record requirements are specified elsewhere in these regulations.

### 5. Inspections.

- A. Each licensee and registrant shall afford the Agency at all reasonable times opportunity to inspect sources of radiation and the premises and facilities wherein such sources of radiation are used or stored.
- B. Each licensee and registrant shall make available to the Agency for inspection, upon reasonable notice, records maintained pursuant to these regulations.
- C. Inspection frequencies are indicated in Appendix A to Part C, and Part F.3.C for radiation material and x-ray machines respectively.

6. **Tests.** Each licensee and registrant shall perform upon instructions from the Agency, or shall permit the Agency to perform, such reasonable tests as the Agency deems appropriate or necessary including, but not limited to, tests of:

- A. source of radiation;
- B. facilities wherein sources of radiation are used or stored;
- C. radiation detection and monitoring instruments; and
- D. other equipment and devices used in connection with utilization or storage of licensed or registered sources of radiation.

7. **Additional Requirements.** The Agency may, by rule, regulation, or order, impose upon any licensee or registrant such requirements in addition to those established in these regulations as it deems appropriate or necessary to minimize danger to public health and safety or property.

**8. Violations.** An injunction or other court order may be obtained prohibiting any violation of any provision of the Act or any regulation or order issued thereunder. Any person who willfully violates any provision of the Act or any regulation or order issued thereunder may be guilty of a crime and, upon conviction, may be punished by fine or imprisonment or both, as provided by law.

**9. Impounding.** Sources of radiation shall be subject to impounding pursuant to Section 688 (2) of the Act.

**10. Prohibited Uses.**

- A. Hand-held fluoroscopic screens shall not be used.
- B. Shoe-fitting fluoroscopic devices shall not be used.

**11 Interpretations.** Except as specifically authorized by the Agency in writing, no interpretation of these regulations by an officer or employee of the Agency other than a written interpretation by the legal counsel will be recognized to be binding upon the Agency.

**12. Communications.** All communications and reports concerning these regulations, and applications filed thereunder, should be addressed to the Radiation Control Program at its office located at 157 Capitol Street, Augusta, Maine 04333. Mail stop is Station #10

**13. The International System of Units (SI).** The Metric Conversion Act of 1975 (PL 94-168) urged the increasing awareness and use of the International System of Units (SI). The generally accepted regulatory values in the narrative portions of this document are followed by the SI equivalents in parentheses. Where appropriate, schedules and appendices are provided with notes concerning conversion factors. The inclusion of the SI equivalent is for informational purposes only unless otherwise specified.

A. Units of Exposure and Dose

- (1) **ABSORBED DOSE.** The unit of absorbed dose is the gray (Gy) which is equal to 1 joule per kilogram. One rad is equal to  $1 \times 10^{-2}$  gray. Sub-multiples included in this document are the milligray (mGy) and the microgray ( $\mu$ Gy).
- (2) **DOSE EQUIVALENT.** The unit of dose equivalent is the sievert (Sv) which is equal to 1 joule per kilogram. The dose equivalent in sievert is equal to the absorbed dose in gray multiplied by the quality factor. One REM is equal to  $1 \times 10^{-2}$  sievert. Submultiples included in this document are the millisievert (mSv) and the microsievert ( $\mu$ Sv).
- (3) **EXPOSURE.** The unit of exposure is the coulomb per kilogram (C/kg). One roentgen is equal to  $2.58 \times 10^{-4}$  coulomb per kilogram of air. Submultiples of this unit are the millicoulomb per kilogram (mC/kg) and the microcoulomb per kilogram ( $\mu$ C/kg).
- (4) **QUALITY FACTORS.** As used in these regulations, the quality factors for converting absorbed dose to dose equivalent are shown in Table I.

**TABLE I**

**QUALITY FACTORS AND ABSORBED DOSE EQUIVALENCIES**

TYPE OF RADIATION	(Q)	Quality Factor Absorbed Dose Equal to a Unit Dose Equivalent <sup>a</sup>
X, gamma, or beta radiation and high-speed electrons	1	1
Alpha particles, multiple-charged particles, fission fragments and heavy particles of unknown charge	20	0.05

Neutrons of unknown energy	10	0.1
<u>High-energy protons</u>	<u>10</u>	<u>0.1</u>

<sup>a</sup> Absorbed dose in gray equal to 1 Sv or the absorbed dose in rad equal to 1 rem.

- (5) If it is more convenient to measure the neutron fluence rate than to determine the neutron dose equivalent rate in sievert per hour or rem per hour, as provided in A.13.A(4), 0.01 Sv (1 rem) of neutron radiation of unknown energies may, for purposes of these regulations, be assumed to result from a total fluence of 25 million neutrons per square centimeter incident upon the body. If sufficient information exists to estimate the approximate energy distribution of the neutrons, the licensee or registrant may use the fluence rate per unit dose equivalent or the appropriate Q value from Table II to convert a measured tissue dose in gray or rad to dose equivalent in sievert or rem.

**TABLE II**

**MEAN QUALITY FACTORS, Q, AND FLUENCE PER UNIT DOSE  
EQUIVALENT FOR MONOENERGETIC NEUTRONS**

Energy (Q)	Factor <sup>a</sup> (neutrons $\text{cm}^{-2} \text{rem}^{-1}$ )	Quality Dose Equivalent <sup>b</sup> (neutrons $\text{cm}^{-2} \text{Sv}^{-1}$ )	Fluence per Unit Dose Equiv. <sup>b</sup>	Fluence/Unit	Neutron (MeV)
(thermal)	2.5E-8	2	980E+6		980E+8
1E-7	2	980E+6	980E+8		1E-6 2
	810E+6	810E+8	1E-5		2
810E+6	810E+8	1E-4	2		840E+6
840E+8	1E-3	2	980E+6		980E+8
1E-2	2.5	1010E+6	1010E+8		1E-1 7.5
	170E+6	170E+8	5E-1		11
39E+6	39E+8	1	11		27E+6
27E+8	2.5	9	29E+6		29E+8 5
	8	23E+6	23E+8		7 7
	24E+6	24E+8	10		6.5
24E+6	24E+8	14	7.5		17E+6
17E+8	20	8	16E+6		16E+8 40
	7	14E+6	14E+8		60 5.5
	16E+6	16E+8	1E+2		4
20E+6	20E+8	2E+2	3.5		19E+6
19E+8	3E+2	3.5	16E+6	16E+8	4E+2 3.5
	14E+6	14E+8			

<sup>a</sup>Value of quality factor (Q) at the point where the dose equivalent is maximum in a 30-centimeter diameter cylinder tissue-equivalent phantom.

<sup>b</sup>Monoenergetic neutrons incident normally on a 30-centimeter diameter cylinder tissue-equivalent phantom.

B. Units of Activity. For purposes of these regulations, activity is expressed in the SI unit of becquerel (Bq) or in the special unit of curie (Ci), or their multiples, or disintegrations or transformations per unit of time.

(1) The unit of measurement of radioactivity is the becquerel (Bq) and it is equal to one transformation per second.

(2) One curie is equal to  $3.7 \times 10^{10}$  disintegrations or transformations per second (dps or tps) =  $3.7 \times 10^{10}$  becquerel (Bq) =  $2.22 \times 10^{12}$  disintegrations or transformations per minute (dpm or tpm). Multiples included in this document are kilobecquerel (kBq), megabecquerel (MBq), gigabecquerel (GBq), and petabecquerel (PBq).

## PART B

# ENFORCEMENT ACTIONS, PROCEDURES, AND CIVIL PENALTIES

### 1. Purpose and Scope.

- A. The following statement of general policy and procedure explains the enforcement policy and procedures of the State of Maine Radiation Control Program in initiating enforcement actions. This statement is applicable to enforcement in matters involving the public health and safety, and the environment.
- B. The purpose of the enforcement program is to promote and protect the radiological health and safety of the public, including employees' health and safety, and the environment by:
  - (1) Ensuring compliance with regulations and license conditions;
  - (2) Obtaining prompt correction of violations and adverse quality conditions which may affect safety;
  - (3) Deterring future violations and occurrences of conditions adverse to quality; and
  - (4) Encouraging improvement of licensee and vendor<sup>1/</sup> performance, and by example, and that of industry, including the prompt identification and reporting of potential safety problems.
- C. Consistent with the purpose of this program, prompt and vigorous enforcement action will be taken when dealing with licensees or vendors who do not achieve the necessary meticulous attention to detail and the high standard of compliance which the Agency expects. It is the state's intent that sanctions should be designed to ensure that a licensee or vendor does not deliberately profit from violations of these requirements. Each enforcement action is dependent on the circumstances of the case and requires the exercise of discretion after consideration of these policies and procedures. In no case, however will licensees who cannot achieve and maintain adequate levels of protection be permitted to conduct licensed activities.

### 2. Severity of Violations.

- A. Regulatory requirements have varying degrees of safety or environmental significance. Therefore, the relative importance of each violation must be identified as the first step in the enforcement process.
- B. Consequently, violations are categorized in terms of five levels of severity to show their relative importance within each of the following five activity areas:
  - I. Health Physics;
  - II. Transportation;
  - III. Materials Operations
  - IV. Miscellaneous Matters; and
  - V. Emergency Preparedness.

**B.2.C.**

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1/ The term "vendor" means a supplier of products or services to be used by a licensee or registrant in a licensed or registered facility or activity.

- C. Within each activity area, Severity Level I has been assigned to violations that are the most significant and Severity Level V violations are the least significant. Severity Level I and II violations are of very significant regulatory concern. In general, violations that are included in these categories involve actual or high potential impact on the public. Severity Level III violations are cause for significant concern. Severity Level IV violations are less serious but are of more than minor concern; i.e. if left uncorrected, they could lead to a more serious concern. Severity Level V violations are of minor safety or environmental concern.
- D. Comparisons of significance between activity areas are inappropriate. For example, the immediacy of any hazard to the public associated with Severity Level I violations in Health Physics is not directly comparable to that associated with Severity Level I violations in Emergency Preparedness.
- E. While examples are provided in Appendix 1 for determining the appropriate severity level for violations in each of the five activity areas, the examples are neither exhaustive nor controlling. These examples do not create new requirements. Each is designed to illustrate the significance which the Radiation Control Program places on a particular type of violation of state requirements. Each of the examples is predicated on a violation of regulatory requirement.
- F. In each case, the severity of a violation will be characterized at the level best suited to the significance of the particular violation. In some cases, violations may be evaluated in the aggregate and a single severity level assigned for a group of violations.
- G. The severity level of a violation may be increased if the circumstances surrounding the matter involve careless disregard of requirements, deception, or other indication of willfulness. The term "willfulness" as used here embraces a spectrum of violations ranging from deliberate intent to violate or falsify to and including careless disregard for requirements. Willfulness does not include acts which do not rise to the level of careless disregard, e.g. inadvertent clerical errors in a document submitted to the Radiation Control Program. In determining the specific severity level of a violation involving willfulness, consideration will be given to such factors as the position of the person involved in the violation (e.g., first-line supervisor or senior manager), the significance or any underlying violation, the intent of the violator (i.e. negligence not amounting to careless disregard, careless disregard, or deliberateness), and the economic advantage, if any, gained as a result of the violation. The relative weight given to each of these factors in arriving at the appropriate severity level will be dependent on the circumstances of the violation.
- H. The Radiation Control Program expects licensees to provide full, complete, timely, and accurate information and reports. Accordingly, unless otherwise categorized in Appendix 1, the severity level of a violation involving the failure to make a required report to the Agency will be based upon the significance of and the circumstances surrounding the matter that should have been reported. A licensee will not normally be cited for a failure to report a condition or event unless the licensee was actually aware of the condition or event, which it failed to report. However, the severity level of an untimely report, in contrast to no report, may be reduced depending on the circumstances surrounding the matter.

### **3. Enforcement Conferences.**

- A. Whenever the Agency has learned of the existence of a potential violation for which a civil penalty or other escalated enforcement action may be warranted, or recurring nonconformance on the part of a vendor, the Agency will normally hold an enforcement conference with the licensee or vendor prior to taking enforcement action. The Agency may also elect to hold an enforcement conference for other violations, e.g. Severity Level IV violation, which, if repeated, could lead to escalated enforcement action. The purpose of the enforcement conference is to
  - (1) Discuss the violations or nonconformance, their significance and causes, and the licensee's or vendor's corrective actions,
  - (2) determine whether there are any aggravating or mitigating circumstances, and

**B.3.A.(3)**

(3) obtain other information which will help determine the appropriate enforcement action.

- B. In addition, during the enforcement conference, the licensee or vendor will be given an opportunity to explain to the Agency what corrective actions (if any) were taken or will be taken following discovery of the potential violation or nonconformance. Licensees or vendors will be told when a meeting is an enforcement conference.
- C. When needed to protect the public health and safety, escalated enforcement action, such as the issuance of an immediately effective order modifying, suspending, or revoking a license, will be taken prior to the enforcement conference. In such cases, an enforcement conference may be held after the escalated enforcement action is taken.

#### **4. Enforcement Actions.**

- A. This Part describes the enforcement sanctions available to the Agency and specifies the conditions under which each may be used. The basic sanctions are notices of violation, civil penalties, and orders of various types. Additionally, related administrative mechanisms such as bulletins and confirmatory action letters, notices of nonconformance and notices of deviation are used to supplement the enforcement program.
- B. In selecting the enforcement sanctions to be applied, the Agency will consider enforcement actions taken by other State regulatory bodies having concurrent jurisdiction, such as in environmental or transportation matters. With very limited exceptions, whenever a violation of Agency requirements is identified, enforcement action is taken. The nature and extent of the enforcement action is intended to reflect the seriousness of the violation involved.
- C. For the vast majority of violations, action by the Agency is appropriate in the form of a Notice of Violation requiring a formal response from the recipients describing its corrective actions.
- D. In situations involving nonconformance on the part of a vendor, a Notice of Nonconformance will be issued.
- E. Relatively small number of cases involve elevated enforcement actions. These elevated enforcement actions include civil penalties orders modifying, suspending or revoking licenses; or orders to cease and desist from designated activities.

#### **5. Notice of Violation.**

- A. Before instituting any proceeding to modify, suspend, or revoke a license or to take other action for alleged violation of any provision of the Radiation Protection Act or these rules or the conditions of the license, the Agency will serve on the licensee or other person subject to the jurisdiction of the Agency a written notice of violation, except as provided in paragraph (3) of this section. The notice of violation will concisely state the alleged violation and will require that the licensee or any other person submit, within twenty (20) working days of the date of the notice or other specified time, a written explanation or statement in reply including:
  - (1) corrective steps which have been taken by the licensee or other person and the results achieved;
  - (2) corrective steps which will be taken; and
  - (3) the date when full compliance will be achieved.
- B. Because the State wants to encourage and support licensee initiative for self-identification and correction of problems, the Radiation Control Program will not generally issue a notice of violation for a violation that meets all of the following tests:
  - (1) It was identified by the licensee;
  - (2) It fits in Severity Level IV or V;
  - (3) It was reported; if required;

**B.5.B.(4)**

- (4) It was or will be corrected, including measures to prevent recurrence, within a reasonable time; and

- (5) It was not a violation that could reasonably be expected to have been prevented by the licensee's corrective action for a previous violation.
- C. Licensees are not ordinarily cited for violations resulting from matters not within their control, such as equipment failures that were not avoidable by reasonable licensee quality assurance measures or management controls. Generally, however, licensees are held responsible for the acts of their employees. Accordingly, this policy should not be construed to excuse personnel errors. Enforcement actions involving individuals, including licensed operators, will be determined on a case-by-case basis, and must be approved by the Director of the Division of Health Engineering, Department of Human Services.
- D. The notice may require the licensee or other person subject to the jurisdiction of the Agency to admit or deny the violation and to state the reasons for the violation, if admitted. It may provide that, if any adequate reply is not received within the time specified in the notice, the Agency may issue an order to show cause why the license should not be modified, suspended or revoked or why such other action as may be proper should not be taken.
- E. When the Agency finds that the public health, safety, or interest so requires, or that the violation is willful, the notice of violation may be omitted and an order to show cause issued.

## **6. Civil Penalties**

- A. A civil penalty is a monetary penalty that may be imposed for violation of
- (1) certain specified licensing provisions of the Radiation Protection Act or these rules, or orders, or
  - (2) any requirement for which a license may be revoked. Civil penalties are designed to emphasize the need for lasting remedial action and to deter future violations.
- B. Before instituting any proceeding to impose a civil penalty authorized under 22 MRSA section 690 of the Radiation Protection Act, the Agency shall serve a written notice of violation upon the person charged. This notice may be included in a notice issued pursuant to Part B.5. The notice of violation shall specify the date or dates, facts, and the nature of the alleged act or omission with which the person is charged, and shall identify specifically the particular provision or provisions of the law, rule, regulation, license, permit, or cease and desist order involved in the alleged violation and shall state the amount of each penalty which the Agency proposes to impose. The notice of violation shall also advise the person charged that the civil penalty may be paid in the amount specified therein, or the proposed imposition of the civil penalty may be protested in its entirety or in part, by a written answer, either denying the violation, or showing extenuating circumstances. The notice of violation shall advise the person charged that upon failure to pay a civil penalty subsequently determined by the Agency, if any, the penalty may, unless compromised, remitted or mitigated, be collected by civil action pursuant to the Act.
- C. Generally, civil penalties are imposed for Severity Level I violations and if mitigating circumstances are absent, for Severity Level II violations. Civil penalties are considered for Severity Level III violations, and may be imposed for Severity Level IV violations that are similar to previous violations for which the licensee did not take effective corrective action.
- D. In applying this guidance for Severity Level IV violations, the Agency normally considers civil penalties only for similar Severity Level IV violations that occur after the date of the last inspection or within two years, whichever period is greater.
- E. Civil penalties will normally be assessed for known and conscious violations of the reporting requirements of these rules and for any willful violation of any Agency requirement including those at any severity level.

### **B.6.F.**

- F. Within twenty (20) working days of the date of a notice of violation or other time specified in the notice, the person charged may either pay the penalty in the amount proposed or answer the notice of violation. The answer to the

notice of violation shall state any facts, explanations, and arguments, denying the charges of violation, or demonstrating any extenuating circumstances, error in the notice of violation, or other reason why the penalty should not be imposed and may request remission or mitigation of the penalty.

- G. If the person charged with the violation fails to answer within the time specified in paragraph (F) of this Part, the Agency will issue an order imposing the civil penalty in the amount set forth in the notice of violation described in paragraph (B) of this Part
- H. If the person charged with violation files an answer to the notice of violations, the Agency, upon consideration of the answer, will issue an order dismissing the proceeding or imposing, mitigating, or remitting the civil penalty. The person charged may, within twenty (20) working days of the date of the order or other time specified in the order, request a hearing.
- I. If the person charged with violation requests a hearing, the Agency will issue an order designating the time and place of hearing.
- J. If a hearing is held, an order will be issued after the hearing by the Agency dismissing the proceeding or imposing, mitigating, or remitting the civil penalty.
- K. If the civil penalty is not compromised, or is not remitted and if payment is not made within ten (10) working days following either the service of the order described in paragraph (G) or (J) of this section, or the expiration of the time for requesting a hearing described in paragraph (H) of this section, no such request having been made, the Agency may refer the matter to the Attorney General for collection.
- L. The Agency may impose different levels of penalties for different severity level violations and different classes of licensees. Tables 1A and 1B show the base civil penalties for various areas. The structure of these tables generally takes into account the gravity of the violation as a primary consideration and the ability to pay as a secondary consideration. Generally, operations involving greater potential consequences to the public and licensee employees will receive higher civil penalties.
- M. Regarding the secondary factor of ability of various classes of licensees to pay the civil penalties, it is not the State's intention that the economic impact of a civil penalty be such that it puts a licensee out of business (orders, rather than civil penalties, are used when the intent is to terminate licensed activities) or adversely affects a licensee's ability to safely conduct licensed activities. The deterrent effect of civil penalties is best served when the amounts of such penalties take into account a licensee's "ability to pay." In determining the amounts of civil penalties for licensees for whom the tables do not reflect the ability to pay, the State will consider as necessary an increase or decrease on a case-by-case basis.
- N. The Agency attaches great importance to the comprehensive licensee programs for detection, correction, and reporting of problems that may constitute, or lead to, violation of regulatory requirements. This is emphasized by giving credit for effective licensee audit programs when licensees find, correct and report problems expeditiously and effectively. To encourage licensee self-identification and correction of violations and to avoid potential concealment of problems of safety significance, application of the adjustment factors set forth below may result in no civil penalty being assessed for violations which are identified, reported (if required), and effectively corrected by the licensee.

#### **B.6.O.**

- O. On the other hand, ineffective licensee programs for problem identification or correction are unacceptable. In cases involving willfulness, flagrant NRC-identified violations, repeated poor performance in an area of concern, or serious breakdown in management controls, the Agency intends to apply its full enforcement authority where such action is warranted, including issuing appropriate orders and assessing civil penalties for continuing violations on a

per day basis, up to statutory limit. In this regard, while management involvement, direct or indirect, in a violation may lead to an increase in the civil penalty, the lack of such involvement may not be used to mitigate a civil penalty.

- P. Allowance of mitigation could encourage lack of management involvement in licensed activities and a decrease in protection of the public health and safety.
- Q. The State reviews each proposed civil penalty case on its own merits and adjusts the base civil penalty values upward or downward appropriately. Tables 1A and 1B identify the base civil penalty values for different severity levels, activity areas, and classes of licensees.
- R. Payment of civil penalties imposed under 22 MRSA section 690 of the Act shall be made by check, draft, or money order payable to the Treasurer of State of Maine, and mailed to: Radiation Control Program, State House Station #10, Augusta, Maine 04333-0010.

## **7. Adjustment Factors.**

- A. After considering all relevant circumstances, adjustments to the civil penalty values may be made for the factors described below:
  - (1) **Prompt Identification and Reporting.** Reduction of up to 50 percent of the base civil penalty may be given when a licensee identifies the violation and promptly reports the violation to the Agency. In weighing this factor, consideration will be given to, among other things, the length of time the violation existed prior to discovery, the opportunity available to discover the violation, the ease of discovery and the promptness and completeness of any required report. No consideration will be given to this factor if the licensee does not take immediate action to correct the problem upon discovery.
  - (2) **Corrective Action to Prevent Recurrence.** Recognizing that corrective action is always required to meet regulatory requirements, the promptness and extent to which the licensee takes corrective action, including actions to prevent recurrence, may be considered in modifying the civil penalty to be assessed. Unusually prompt and extensive correction action may result in reducing the proposed civil penalty as much as 50 percent of the base value shown in Table 1A. On the other hand, the civil penalty may be increased as much as 50 percent of the base value if initiation of corrective action is not prompt or if the corrective action is only minimally acceptable. In weighing this factor, consideration will be given to, among other things, the timeliness of the corrective action, degree of licensee initiative, and comprehensiveness of the corrective action - such as whether the action is focused narrowly to the specific violation or broadly to the general area of concern.
  - (3) **Past Performance.** Reduction by as much as 100 percent of the base civil penalty shown in Table 1 may be given for prior good performance in the general area of concern. On the other hand, the base civil penalty may be increased as much as 100 percent for prior poor performance in the general area of concern. In weighing this factor, consideration will be given to, among other things, the effectiveness of previous corrective action for similar problems, overall performance such as prior enforcement history including Severity Level IV and V violations in the area of concern. For example, failure to implement previous corrective action for prior similar problems may result in an increase in the civil penalty.
  - (4) **Prior Notice of Similar Events.** The base civil penalty may be increased as much as 50 percent for cases where the licensee had prior knowledge of a problem as a result of a licensee audit, or specific NRC or industry notification, and had failed to take effective preventive steps.
  - (5) **Multiple Occurrences.** The base civil penalty may be increased as much as 50 percent where multiple examples of a particular violation are identified during the inspection period.

### **7.B.**

- B. The above factors are additive. However, in no instance will a civil penalty for any one violation exceed \$10,000 per day.
- C. The duration of a violation may also be considered in assessing a civil penalty. A greater civil penalty may be imposed if a violation continues for more than a day. For example:

- (1) If a licensee is aware of the existence of a condition which results in an ongoing violation and fails to initiate corrective action, each day the condition existed may be considered as a separate violation and, as such, subject to a separate additional civil penalty.
  - (2) If a licensee is unaware of a condition resulting in a continuing violation, but clearly should have been aware of the condition or had an opportunity to correct the condition but failed to do so, a separate violation and attendant civil penalty may be considered for each day that the licensee clearly should have been aware of the condition or had an opportunity to correct the condition, but failed to do so.
  - (3) Alternatively, whether or not a licensee is aware or should have been aware of a violation that continues for more than one day, the civil penalty imposed for one violation may be increased to reflect the added significance resulting from the duration of the violation.
- D. The Tables and the mitigating factors determine the civil penalties which may be assessed for each violation. However, to focus on the fundamental underlying causes of a problem for which enforcement action appears to be warranted, the cumulative total for all violations which contributed to or were unavoidable consequences of that problem may be based on the amount shown in the table for a problem of that Severity Level, as adjusted. If an evaluation of such multiple violations shows that more than one fundamental problem is involved, each of which, if viewed independently, could lead to civil penalty action by itself, then separate civil penalties may be assessed for each such fundamental problem. In addition, the failure to make a required report of an event requiring such reporting is considered a separate problem and will normally be assessed a separate civil penalty, if the licensee is aware of the matter that should have been reported.

## 8. Orders.

A. An order is a written Agency directive to modify, suspend, or revoke a license to cease and desist from a given practice or activity or to take such other action as may be proper. Orders may be issued as set forth below. Orders may also be issued in lieu of, or in addition to, civil penalties as appropriate.

- (1) License Modification Orders are issued when some change in licensee equipment, procedures, or management controls is necessary.
  - (a) The Agency may modify a license by issuing an amendment on notice to the licensee that the licensee may demand a hearing with respect to all or any part of the amendment within twenty (20) working days from the date of the notice or such longer period as the notice may provide.
  - (b) The amendment will become effective on the expiration of the 20-day period during which the licensee may demand a hearing. If the licensee requests a hearing during this 20-day period, the amendment will become effective on the date specified in an order made following the hearing.
- (2) Suspension Orders may be used:
  - (a) To remove a threat to the public health and safety or the environment;
  - (b) To stop facility construction when: (a) further work could preclude or significantly hinder the identification or correction of an improperly constructed safety-related system or component, to include shielding, or (b) the licensee's quality assurance program implementation is not adequate to provide confidence that construction activities are being properly carried out;

### B.8.A.(2)(c)

- (c) When the licensee has not responded adequately to other enforcement action;
- (d) When the licensee interferes with the conduct of an inspection or investigation; or

(e) For any reason not mentioned above for which license revocation is legally authorized.

Suspensions may apply to all or part of the licensed activity. Ordinarily, a licensed activity is not suspended (nor is a suspension prolonged) for failure to comply with requirements where such failure is not willful and adequate corrective action has been taken.

(3) Revocation Orders may be used:

- (a) When a licensee is unable or unwilling to comply with Maine requirements;
- (b) When a licensee refuses to correct a violation;
- (c) When a licensee does not respond to a notice of violation where a response was required;
- (d) When a licensee refuses to pay as stated in Appendix 1 to Part C.
- (e) For any other reason for which revocation is authorized under Section 677 of the Radiation Protection Act (e.g., any condition which would warrant refusal of a license on an original application).

(4) Cease and Desist Orders are typically used to stop an unauthorized activity that has continued after notification by the Agency that such Activity is unauthorized.

(5) Show Cause Orders.

- (a) The Agency may institute a proceeding to modify, suspend, or revoke a license or for such other action as may be proper by serving on the licensee an order to show cause which will:
  - (i) allege the violations with which the licensee is charged, or the potentially hazardous conditions or other facts deemed to be sufficient ground for the proposed action;
  - (ii) provide that the licensee may file a written answer to the order under oath or affirmation within twenty (20) working days of its date, or such other time as may be specified in the order;
  - (iii) inform the licensee of his right, within twenty (20) working days of that date of the order, or such other time as may be specified in the order, to demand a hearing;
  - (iv) specify the issues; and
  - (v) state the effective date of the order.
- (b) A licensee may respond to an order to show cause; by filing a written answer under oath or affirmation. The answer shall specifically admit or deny each allegation or charge made in the order to show cause;, and may set forth the matters of fact and law on which the licensee relies. The answer may demand a hearing.
- (c) If the answer demands a hearing, the Agency will issue an order designating the time and place of hearing.
- (d) An answer or stipulation may consent to the entry of an order in substantially the form proposed in the order to show cause;.

**B. 8.A.(5)(e)**

- (e) The consent of the licensee to the entry of an order shall constitute a waiver by the licensee of a hearing, findings of fact and conclusions of law, and of all right to seek Agency and judicial review or to contest the validity of the order in any forum. The order shall have the same force and effect as an order made after hearing by the Agency.

- B. Orders are made effective immediately, without prior opportunity for hearing whenever it is determined that the public health, interest, or safety so requires, or when the order is responding to a violation involving willfulness. Otherwise, a prior opportunity for a hearing on the order is afforded. For cases in which the Agency believes a basis could reasonably exist for not taking the action as proposed, the licensee will ordinarily be afforded an opportunity to show cause why the order should not be issued in the proposed manner.

## 9. Escalation of Enforcement Sanctions

- A. The Agency considers violations of Severity Levels I, II, or III to be serious. If serious violations occur, the Agency will, where necessary, issue orders in conjunction with civil penalties to achieve immediate corrective actions and to deter further recurrence of serious violations. The Agency carefully considers the circumstances of each case in selecting and applying the sanction(s) appropriate to the case in accordance with the criteria described in sections 5, 6, 7, and 8 of this Part.
- B. Examples of enforcement actions that could be taken for similar Severity Level I, II or III violations are set forth in Table 2. The actual progression to be used in a particular case will depend on the circumstances. However, enforcement sanctions will normally escalate for recurring similar violations.
- C. Normally, the progression of enforcement actions for similar violations will be based on violations under a single license. When more than one facility is covered by a single license, the normal progression will be based on similar violations at an individual facility and not on similar violations under the same license. However, it should be noted that under some circumstances, e.g., where there is common control over some facet of facility operations, similar violations may be charged even though the second violation occurred at a different facility or under a different license. For example, a health physics violation at division 1 of a dual unit hospital that repeats an earlier violation of division 2 might be considered similar.

**TABLE 1A - BASE CIVIL PENALTIES**

	Health Physics, Operations, EP, and Miscellaneous	Transportation	
		Greater Than Type A Quantity <sup>1</sup>	Type A Quantity or less <sup>2</sup>
a. Industrial users of material <sup>3</sup>	10,000	5,000	2,000
b. Waste disposal licensees	10,000	5,000	2,000
c. Academic or medical institutions <sup>4</sup>	5,000	2,500	1,000
d. Other material licenses	2,000	2,500	1,000
e. X-ray facilities	1,000		

1 Includes quantities requiring Type B packaging.

2 Includes low specific activity waste, low level waste, Type A packages and excepted quantities and articles.

3 Includes industrial radiographers, nuclear pharmacies, and other industrial users.

4 This applies to nonprofit institutions not otherwise categorized under section "a" through "e" in this table.

**B. 9.C.**

**TABLE 1B - BASE CIVIL PENALTIES**

Severity Level	Base Civil Penalty Amount <sup>1</sup>
I	100
II	80
III	50
IV	15
V	5

<sup>1</sup> Percent of amount listed in table 1A.

**TABLE 2 - EXAMPLES OF PROGRESSIONS OF ESCALATED ENFORCEMENT ACTIONS FOR SIMILAR VIOLATIONS IN THE SAME ACTIVITY AREA UNDER THE SAME LICENSE**

Severity of Violation	Number of similar violations from the date of the last inspection or within the previous 2 years (whichever period is greater)		
	1st	2nd	3rd
I	a+b	a+b+c	d
II	a	a+b	a+b+c
III	----	a	a+b

- a. Civil penalty.
- b. Suspension of affected operations until the Radiation Control Program Manager is satisfied that there is reasonable assurance that the licensee can operate in compliance with the applicable requirements or modification of the license, as appropriate.
- c. Show cause for modification or revocation of the license, as appropriate.
- d. further action, as appropriate.

**10. Related Administrative Actions.** In addition to the formal enforcement mechanisms of notices of violation, civil penalties, and orders, the Agency also uses administrative mechanisms, such as bulletins, circulars, information notices, generic letters, notices of deviation, notices of nonconformance and confirmatory action letters to supplement its enforcement program. The Agency expects licensees and vendors to adhere to any obligations and commitments resulting from these processes and will not hesitate to issue appropriate orders to licensees to make sure that such commitments are met.

- A. Bulletins, Circulars, Information Notices and Generic Letters are written notifications to groups of licensees identifying specific problems and recommending specific actions.
- B. Notices of Deviation are written notices describing a licensee's failure to satisfy a commitment where the commitment involved has not been made a legally binding requirement. A notice of deviation requests a licensee to provide a written explanation or statement describing corrective steps taken (or planned), the result achieved, and the date when corrective action will be completed.
- C. Confirmatory Action Letters are letters confirming a licensee's or vendor's agreement to take certain actions to remove significant concerns about health and safety, safeguards, or the environment.

**B. 10.D.**

- D. Notices of Nonconformance are written notices describing non-licensees' failure to meet commitments which have not been made legally binding requirements by the Agency. Notices of Non-conformances request non-licensees to provide written explanation or statements describing corrective steps (taken or planned), the results achieved, the dates when corrective actions will be completed, and measures taken to preclude recurrence.

- 11. Referrals to Department of the Attorney General.** Alleged or suspected criminal violations of the Radiation Protection Act (and of other relevant state laws) are referred to the Department of the Attorney General for investigation. Referral to the Attorney General does not preclude the Agency from taking other enforcement action. However, such actions will be coordinated with the Department of the Attorney General to the extent practicable.
- 12. Public Disclosure of Enforcement Actions.** In accordance with the Administrative Procedures Act, all enforcement actions and licensees' responses are publicly available for inspection. In addition, press releases are generally issued for civil penalties and orders. In the case of orders and civil penalties related to violations at Severity Level I, II, or III, press releases are issued at the time of the order or the proposed imposition of the civil penalty. Press releases are not normally issued for Notices of Violation.

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# APPENDIX 1

## SEVERITY CATEGORIES

*The following examples of severity levels are neither exhaustive nor controlling. They reflect only the seriousness of the violation and not the intent of the violator, the history of the violator, the amount necessary to deter future violations, or efforts to correct the violation.*

### 1. Severity Level I - Most Significant Violations.

#### A. Health Physics.

1. Single exposure of a worker in excess of 25 rems of radiation to the whole body, 150 rems to the skin of the whole body, or 375 rems to the feet, ankles, hands, or forearms;
2. Annual whole body exposure of a member of the public in excess of 2.5 rems of radiation;
3. Release of radioactive material to an unrestricted area in excess of ten times the limits of section D.7.;
4. Disposal of licensed material in quantities or concentrations in excess of ten times the limits of section D.18.;
5. Exposure of a worker in restricted areas of ten times the limits of section D.4.;

#### B. Transportation.

1. Annual whole body radiation exposure of a member of the public in excess of 0.5 rems of radiation; or
2. Breach of package integrity resulting in surface contamination or external radiation levels in excess of ten times the Agency limits.

#### C. Materials Operations.

1. Radiation levels, contamination levels, or releases that exceed ten times the limits specified in the license;
2. A system designed to prevent or mitigate a serious safety event not being operable when actually required to perform its design function.

#### D. Miscellaneous Matters.

1. A Material False Statement (MFS)<sup>2/</sup> in which the statement made was deliberately false;
2. Falsification of records which the Agency requires be kept of significant information in which the records were deliberately falsified by or with the knowledge of management; or
3. A knowing and intentional failure to provide the notice required by these rules.
4. Possession of licensable quantities of radioactive material without a license, or loss of control of a source of radiation.

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2./ In essence, a Material False Statement is a statement that is false by omission or commission and is relevant to the regulatory process. As can be seen in the examples, in determining the specific level of a violation involving material false statements or falsification of records, consideration will be given to such factors as the position of the person involved in the violation (e.g., first line supervisor or senior manager), the significance of the information involved, and the intent of the violator (i.e., negligence not amounting to careless disregard, carelessness, or deliberateness). The relative weight given to each of these factors in arriving at the appropriate severity level will be dependent on the circumstances of the violation.

5. Refusing authorized Agency personnel access to facilities, records and/or equipment to conduct inspections or investigations.

E. Emergency Preparedness. In an emergency, licensee failure to promptly (a) correctly identify the event, (b) make required notifications to responsible Federal, State, and local agencies, or (c) respond to the event (e.g. assess actual or potential offsite consequences, activate emergency response facilities, and augment shift staff).

## 2. Severity Level II - Very Significant Violations.

### A. Health Physics.

1. Single exposure of a worker in excess of 5 rems of radiation to the whole body, 30 rems to the skin of the whole body or 75 rems to the feet, ankles, hands or forearms;
2. Annual whole body exposure of a member of the public in excess of 0.5 rems of radiation;
3. Release of radioactive material to an unrestricted area in excess of five times the limits of Part D.7.;
4. Failure to make an immediate notification as required by Part D.29.A, and B;
5. Disposal of license material in quantities or concentrations in excess of five times the limits of Part D.18.;
6. Exposure of a worker in restricted areas in excess of five times the limits of Part D.4.;
7. An x-ray system having a malfunction such that inadvertent exposures could occur e.g., a system such that when the exposure switch is activated, not one but repeated exposures occur, or the timer fails to terminate exposure, or exposure initiated without utilizing the exposure switch.
8. A fluoroscopic x-ray system with a tabletop entrance exposure rate of greater than or equal to 25 R/min. at the point where the center of the useful beam enters the patient, except:
  - (a) During recording of fluoroscopic images, or
  - (b) When an optional high level control is activated.
9. A fluoroscopic system such that the entire x-ray beam is not intercepted by the primary protective barrier, or
10. Therapy systems which exhibit excessive leakage and/or inoperable door interlocks, shutters, timers, etc.
11. Therapy system, with improper operator/patient communication/observation.

### B. Transportation.

1. Breach of package integrity resulting in surface contamination or external radiation levels in excess of Agency requirements;
2. Surface contamination or external radiation levels in excess of five times Agency limits that did not result from a breach of package integrity; or
3. Failure to make required initial notifications associated with Severity Level I or II violations.

C. Material Operations.

1. Radiation levels, contamination levels, or releases that exceed five times the limits specified in the license; or
2. A system designed to prevent or mitigate a serious safety event being inoperable.

D. Miscellaneous Matters.

1. A MFS or a reporting failure, involving information which, had it been available to the Agency and accurate at the time the information should have been submitted, would have resulted in regulatory action or would likely have resulted in the Agency seeking further information;
2. A MFS in which the false statement was made with careless disregard;
3. Deliberate falsification of records which the Agency requires be kept involving significant information; or
4. A failure to provide the notice required.
5. Failure to register sources of radiation or services as required by these rules.
6. Action by management to discriminate against an employee for attempting to communicate or for actually communicating with the Agency.

E. Emergency Preparedness.

1. Licensee failure to meet or implement more than one emergency planning standard involving assessment or notification.

**3. Severity Level III - Significant Violations.**

A. Health Physics.

1. Single exposure of a worker in excess of 3 rems of radiation to the whole body, 7.5 rems to the skin of the whole body, or 18.75 rems to the feet, ankles, hands or forearms;
2. A radiation level in an unrestricted area such that an individual could receive greater than 100 millirem in a one hour period or 500 millirem in any seven consecutive days;
3. Failure to make a 24-hour notification as required by Part D.28 or an immediate notification required by Part D.29.;
4. Substantial potential for an exposure or release in excess of Part D of these rules, whether or not such exposure or release occurs (e.g., entry into high radiation areas, such as under reactor vessels or in the vicinity of exposed radiographic sources, without having performed an adequate survey, operation of a radiation facility with a nonfunctioning interlock system);
5. Release of radioactive material to an unrestricted area in excess of the limits of D.7;
6. Improper disposal of licensed material not covered in Severity Level I or II;
7. Exposure of worker in restricted areas in excess of the limits of Part D.4.;
8. Release for unrestricted use of contaminated or radioactive material or equipment which poses a realistic potential for significant exposure to members of the public, or which reflects a programmatic (rather than isolated) weakness in the radiation control program;

9. Cumulative worker exposure above regulatory limits when such cumulative exposure reflects a programmatic, rather than an isolated weakness in radiation protection;
  10. Conduct of licensee activities by a technically unqualified person;
  11. Significant failure to control licensed material;
  12. Failure to use exposure reduction devices properly (e.g., collimators, filtration);
  13. For a fluoroscopic system where the maximum allowable tabletop exposure rate is 5 R/min., test values of greater than or equal to 7 R/min. (uncorrected), but less than 25 R/min. Correspondingly, for a maximum allowable rate of 10 R/min., test values of greater than or equal to 14 R/min. (uncorrected) but less than 25 R/min. are included;
  14. A radiographic x-ray system having positive beam limitation where the x-ray field size in the plane of the image receptor, whether automatically or manually adjusted, is such that either the length or the width of the x-ray field differs from that of the image receptor by greater than 10 percent of the SID when the equipment indicates that the beam axis is perpendicular to the plane of the image receptor.
  15. Intraoral dental systems capable of operations in the above 50 kVp range for which the field size at the cone tip is greater than or equal to 9 centimeters or which exhibit a minimum SSD less than 16 centimeters.
  16. Dental radiographic systems in which it is possible to produce x-rays with the timer in the zero or off position.
  17. Mammographic x-ray systems in which the edge of the x-ray field at the chestwall extends beyond the edges of the image receptor by more than 5 percent of the source to image receptor distance.
  18. Therapy systems which fail to maintain proper surveys, calibrations, spot checks or operating procedures.
- B. Transportation.
1. Breach of package integrity
  2. Surface contamination or external radiation levels in excess of, but less than a factor of five above Agency requirements that did not result from a breach of package integrity;
  3. Any noncompliance with labeling, placarding, shipping paper, packaging loading, or other requirements that could reasonably result in the following:
    - (a) Improper identification of the type, quantity, or form of material;
    - (b) Failure of the carrier or recipient to exercise adequate controls; or
    - (c) Substantial potential for personnel exposure or contamination, or improper transfer of material; or
  4. Failure to make required initial notification associated with Severity Level III violations.
- C. Materials Operations.
1. Failure to control access to licensed materials for radiation purposes as specified by Agency requirements;
  2. Possession or use of unauthorized equipment or materials in the conduct of licensee activities which degrades safety;
  3. Use of radioactive material on humans where such use is not authorized;
  4. Conduct of licensed activities by a technically unqualified person;

**Appendix 1**

5. Radiation levels, contamination levels, or releases that exceed the limits specified in the license; or
6. Medical therapeutic misadministrations.
7. Failure to obtain appropriate Agency approval before moving to a new use and/or storage location.

D. Miscellaneous Matters.

1. An MFS not amounting to a Severity Level I or II violation; or
2. Deliberate falsification, or falsification by or with the knowledge of management of records which the Agency requires be kept that did not involved signification information.

E. Emergency Preparedness.

1. Violations of lesser severity than Severity Level II violations.

**4. Severity Level IV - Violations.**

A. Health Physics

1. Exposures in excess of the limits of Part D.2. not constituting Severity Level I, II, or III violations;
2. A radiation level in an unrestricted area such that an individual could receive greater than 2 millirem in a one-hour period or 100 millirem in any seven consecutive days;
3. Failure to make a 30-day notification required by Part D.30.;
4. Failure to make a follow-up written report as required by Parts D.28., D.32., and J.4.; or
5. Any other matter that has more than minor safety or environmental significance.
6. A capacitor storage radiographic system such that the standby radiation is greater than 3.0 mR/hr, but less than 25 mR/hr.
7. Systems equipped with positive beam limitation devices which do not allow the field size to be reduced to a size less than that of the image receptor.
8. Systems equipped with positive beam limiting devices which do not provide for an automatic return to PBL from a reduced field size.
9. Mobile radiographic systems for which the minimum source to skin distance is less than 27.5 centimeters.
10. Mammographic systems manufactured after October 1977 for which the edges of the x-ray field on the right or left sides extend beyond the edges of the image receptor. If manufactured prior to November 1977 and the edges of the x-ray field on either side extend beyond the edge of the image receptor by more than 5 percent of the SID.

B. Transportation.

1. Package selection or preparation requirements which do not result in a breach of package integrity or surface contamination or external radiation levels in excess of Agency requirements; or
2. Other violations that have more than minor safety or environmental significance.

C. Material Operations.

**Appendix 1**

1. Failure to maintain patients hospitalized who have cobalt-60, cesium-137, or iridium-192 implants or to conduct required leakage or contamination tests, or to use properly calibrated equipment;
2. Other violations that have more than minor safety or environmental significance; or
3. Failure to report medical diagnostic misadministrations.

D. Miscellaneous Matters.

1. A false statement caused by an inadvertent clerical or similar error involving information which, had it been available to the Agency and accurate at the time the information should have been submitted, would probably not have resulted in regulatory action or the Agency seeking additional information.
2. Unless specified in a more severe category, changes in procedures or other conditions of a license or certificate of registration of which the Agency was not informed (e.g., change of address, expiration of certificate of registration); or

E. Emergency Preparedness.

1. Violations of lesser severity than Severity Level III violations.

**5. Severity Level V - Minor Violations.**

A. Health Physics.

1. For a fluoroscopic x-ray system where the maximum allowable tabletop exposure rate is 5 R/min., test values of greater than 5.0 R/min. (uncorrected), but less than 7.0 R/min. Correspondingly, if the maximum allowable tabletop exposure rate is 10 R/min., test values of greater than 10.0 R/min. (uncorrected) but less than 14.0 R/min. are included.
2. Other violations that have minor safety or environmental significance.

B. Transportation.

1. Other violations that have minor safety or environmental significance.

C. Materials Operations.

1. Other violations that have minor safety or environmental significance.

E. Miscellaneous Matters.

1. Other violations that have minor safety or environmental significance.

F. Emergency Preparedness.

1. Other violations that have minor safety or environmental significance.

## PART C

### LICENSING OF RADIOACTIVE MATERIAL

#### 1. Purpose and Scope.

- A. This Part and Parts G and L provide for the licensing of radioactive material and the assignment of fees for such licenses.<sup>1/</sup> No person shall receive, possess, use, transfer, own or acquire radioactive material except as authorized in a specific or general license issued pursuant to this part or as otherwise provided in this part or in a specific or general license issued pursuant to Parts G or L. Fees are specifically addressed in Appendix A to Part C.
- B. In addition to the requirements of this part, all licensees are subject to the requirements of Parts A, D, and J and L of these regulations. Licensees engaged in industrial radiographic operations are subject to the requirements of Part E, licensees using sealed sources radionuclides in the healing arts are subject to the requirements of Part G and licensees engaged in wireline and subsurface tracer studies are subject to the requirements of Part K of these regulations.

### EXEMPTIONS

#### 2. Source Material.

- A. Any person is exempt from this part to the extent that such person receives, possesses, uses, owns, or transfers source material in any chemical mixture, compound, solution, or alloy in which the source material is by weight less than 1/20 of 1 percent (0.05 percent) of the mixture, compound, solution, or alloy.
- B. Any person is exempt from this part to the extent that such person receives, possesses, uses, or transfers unrefined and unprocessed ore containing source material; provided that, except as authorized in a specific license, such person shall not refine or process such ore.
- C. Any person is exempt from this part to the extent that such person receives, possesses, uses, or transfers:
- (1) any quantities of thorium contained in:
    - (a) incandescent gas mantles,
    - (b) vacuum tubes,
    - (c) welding rods,
    - (d) electric lamps for illuminating purposes provided that each lamp does not contain more than 50 milligrams of thorium,
    - (e) germicidal lamps, sunlamps, and lamps for outdoor or industrial lighting provided that each lamp does not contain more than 2 grams of thorium,
    - (f) rare earth metals and compounds, mixtures, and products containing not more than 0.25 percent by weight thorium, uranium, or any combination of these, or
    - (g) personnel neutron dosimeters, provided that each dosimeter does not contain more than 50 milligrams of thorium;

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<sup>1/</sup> Attention is directed to the fact that regulation by the State of source material, byproduct material, and special nuclear material in quantities not sufficient to form a critical mass is subject to the provisions of the agreement between the State and the U.S. Nuclear Regulatory Commission and to 10 CFR Part 150 of the Commission's regulations.

- (2) source material contained in the following products:
  - (a) glazed ceramic tableware, provided that the glaze contains not more than 20 percent by weight source material,
  - (b) glassware containing not more than 10 percent by weight source material, but not including commercially manufactured glass brick, pane glass, ceramic tile or other glass, or ceramic used in construction, or
  - (c) glass enamel and glass enamel frit containing not more than 10 percent by weight source material imported or ordered for importation into the United States, or initially distributed by manufacturers in the United States, before July 25, 1983<sup>2/</sup>; or
  - (d) piezoelectric ceramic containing not more than 2 percent by weight source material;
- (3) photographic film, negatives, and prints containing uranium or thorium;
- (4) any finished product or part fabricated of, or containing, tungsten-thorium or magnesium-thorium alloys, provided that the thorium content of the alloy does not exceed 4 percent by weight and that this exemption shall not be deemed to authorize the chemical, physical, or metallurgical treatment or processing of any such product or part;
- (5) uranium contained in counterweights installed in aircraft, rockets, projectiles, and missiles, or stored or handled in connection with installation or removal of such counterweights, provided that:
  - (a) the counterweights are manufactured in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission, authorizing distribution by the licensee pursuant to 10 CFR Part 40,
  - (b) each counterweight has been impressed with the following legend clearly legible through any plating or other covering: "DEPLETED URANIUM",
  - (c) each counterweight is durably and legibly labeled or marked with the identification of the manufacturer and the statement: "UNAUTHORIZED ALTERATIONS PROHIBITED", and
  - (d) this exemption shall not be deemed to authorize the chemical, physical, or metallurgical treatment or processing of any such counterweights other than repair or restoration of any plating or other covering;
- (6) natural or depleted uranium metal used as shielding constituting part of any shipping container provided that:
  - (a) the shipping container is conspicuously and legibly impressed with the legend "CAUTION-RADIOACTIVE SHIELDING-URANIUM", and
  - (b) the uranium metal is encased in mild steel or equally fire resistant metal of minimum wall thickness of one-eighth inch (3.2 mm);
- (7) thorium contained in finished optical lenses, provided that each lens does not contain more than 30 percent by weight of thorium, and that this exemption shall not be deemed to authorize either
  - (a) the shaping, grinding, or polishing of such lens or manufacturing processes other than the assembly of such lens into optical systems and devices without any alteration of the lens, or
  - (b) the receipt, possession, use, or transfer of thorium contained in contact lenses, or in spectacles, or in eyepieces in binoculars or other optical instruments;

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<sup>2/</sup> On July 25, 1983, the exemption of glass enamel or glass enamel frit was suspended. The exemption was eliminated on September 11, 1984.

- (8) uranium contained in detector heads for use in fire detection units, provided that each detector head contains not more than 0.005 microcuries of uranium; or
  - (9) thorium contained in any finished aircraft engine part containing nickel-thoria alloy, provided that
    - (a) the thorium is dispersed in the nickel-thoria alloy in the form of finely divided thoria (thorium dioxide), and
    - (b) the thorium content in the nickel-thoria alloy does not exceed 4 percent by weight.
- D. The exemptions in C.2.C do not authorize the manufacture of any of the products described.

### **3. Radioactive Material Other Than Source Material.**

#### **A. Exempt Concentrations**

- (1) Except as provided in C.3.A(2), any person is exempt from this part to the extent that such person receives, possesses, uses, transfers, owns or acquires products containing radioactive material introduced in concentrations not in excess of those listed in Schedule B of this Part.
- (2) No person may introduce radioactive material into a product or material knowing or having reason to believe that it will be transferred to persons exempt under C.3.A(1) or equivalent regulations of the U.S. Nuclear Regulatory Commission, any Agreement State or Licensing State, except in accordance with a specific license issued pursuant to C.11.A. or the general license provided in C.23.

#### **B. Exempt Quantities.**

- (1) Except as provided in C.3.B.3 and 4, any person is exempt from these regulations to the extent that such person receives, possesses, uses, transfers, owns, or acquires radioactive material in individual quantities each of which does not exceed the applicable quantity set forth in Schedule B of this part.
- (2) Any person who possesses radioactive material received or acquired under the general license formerly provided in C.6.F(4)(b)(ii) is exempt from the requirements for a license set forth in this part to the extent that such person possesses, uses, transfers or owns such radioactive material. Such exemption does not apply for radium-226.
- (3) This paragraph (C.3.B) does not authorize the production, packaging or repackaging of radioactive material for purposes of commercial distribution, or the incorporation of radioactive material into products intended for commercial distribution.
- (4) No person may, for purposes of commercial distribution, transfer radioactive material in the individual quantities set forth in Schedule B, knowing or having reason to believe that such quantities of radioactive material will be transferred to persons exempt under C.3.B or equivalent regulations of the U.S. Nuclear Regulatory Commission, any Agreement State or Licensing State, except in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission pursuant to Section 32.18 of 10 CFR Part 32 or by the Agency pursuant to C.11.B which license states that the radioactive material may be transferred by the licensee to persons exempt under C.3.B or the equivalent regulations of the U.S. Nuclear Regulatory Commission, any Agreement State or Licensing State.

## C. Exempt Items.

- (1) Certain Items Containing Radioactive Material. Except for persons who apply radioactive material to, or persons who incorporate radioactive material into the following products, any person is exempt from these regulations to the extent that he receives, possesses, uses, transfers, owns, or acquires the following products<sup>3/</sup> /
- (a) Timepieces or hands or dials containing not more than the following specified quantities of radioactive material and not exceeding the following specified radiation dose rate:
    - (i) 25 millicuries of tritium per timepiece.
    - (ii) 5 millicuries of tritium per hand.
    - (iii) 15 millicuries of tritium per dial (bezels when used shall be considered as part of the dial).
    - (iv) 100 microcuries of promethium-147 per watch or 200 microcuries of promethium-147 per any other timepiece.
    - (v) 20 microcuries of promethium-147 per watch hand or 40 microcuries of promethium-147 per other timepiece hand.
    - (vi) 60 microcuries of promethium-147 per watch dial or 120 microcuries of promethium-147 per other timepiece dial (bezels when used shall be considered as part of the dial).
    - (vii) The levels of radiation from hands and dials containing promethium-147 will not exceed, when measured through 50 milligrams per square centimeter of absorber:
      - (a) For wrist watches, 0.1 millirad per hour at 10 centimeters from any surface.
      - (b) For pocket watches, 0.1 millirad per hour at 1 centimeter from any surface.
      - (c) For any other timepiece, 0.2 millirad per hour at 10 centimeters from any surface.
    - (viii) One microcurie of radium-226 per timepiece in timepieces acquired prior to the effective date of these regulations.
  - (b) Lock illuminators containing not more than 15 millicuries of tritium or not more than 2 millicuries of promethium-147 installed in automobile locks. The radiation dose rate from each lock illuminator containing promethium-147 will not exceed 1 millirad per hour at 1 centimeter from any surface when measured through 50 milligrams per square centimeter of absorber.
  - (c) Precision balances containing not more than 1 millicurie of tritium per balance or not more than 0.5 millicurie of tritium per balance part.
  - (d) Automobile shift quadrants containing not more than 25 millicuries of tritium.
  - (e) Marine compasses containing not more than 750 millicuries of tritium gas and other marine navigational instruments containing not more than 250 millicuries of tritium gas.

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<sup>3/</sup> Authority to transfer possession or control by the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing byproduct material whose subsequent possession, use, transfer, and disposal by all other persons are exempted from regulatory requirements may be obtained only from the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

- (f) Thermostat dials and pointers containing not more than 25 millicuries of tritium per thermostat.
- (g) Electron tubes; provided, that each tube does not contain more than one of the following specified quantities of byproduct material:
  - (i) 150 millicuries of tritium per microwave receiver protector tube or 10 millicuries of tritium per any other electron tube.
  - (ii) 1 microcurie of cobalt-60.
  - (iii) 5 microcuries of nickel-63.
  - (iv) 30 microcuries of krypton-85.
  - (v) 5 microcuries of cesium-137.
  - (vi) 30 microcuries of promethium-147.

And provided further, that the radiation dose rate from each electron tube containing byproduct material does not exceed 1 millirad per hour at 1 centimeter from any surface when measured through 7 milligrams per square centimeter of absorber.<sup>4</sup> /

- (h) Ionizing radiation measuring instruments containing, for purposes of internal calibration or standardization, a source of radioactive material, provided that:
  - (i) Each source contains no more than one exempt quantity set forth in Schedule B of this part, and
  - (ii) Each instrument contains no more than 10 exempt quantities. For purposes of this requirement, an instrument's source(s) may contain either one or different types of radionuclides and an individual exempt quantity may be composed of fractional parts of one or more of the exempt quantities in Schedule B of this part, provided that the sum of such fractions shall not exceed unity.
  - (iii) For purposes of this paragraph , 0.05 microcurie of americium-241 is considered an exempt quantity under Schedule B of this section.
- (j) Spark gap irradiators containing not more than 1 microcurie of cobalt-60 per spark gap irradiator for use in electrically ignited fuel oil burners having a firing rate of at least 3 gallons (11.4 liters) per hour.

(2) Self-Luminous Products Containing Radioactive Material.

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<sup>4</sup>/ For purposes of C.3.C.1.(g), "electron tubes" include spark gap tubes, power tubes, gas tubes including glow lamps, receiving tubes, microwave tubes, indicator tubes, pick-up tubes, radiation detection tubes, and any other completely sealed tube that is designed to conduct or control electrical currents.

- (a) Tritium, Krypton-85, or Promethium-147. Except for persons who manufacture, process, or produce self-luminous products containing tritium, krypton-85, or promethium-147, any person is exempt from these regulations to the extent that such person receives, possesses, uses, transfers, owns, or acquires tritium, krypton-85 or promethium-147 in self-luminous products manufactured, processed, produced, imported, or transferred in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission pursuant to Section 32.22 of 10 CFR Part 32, which license authorizes the transfer of the product to persons who are exempt from regulatory requirements. The exemption in C.3.C.2. does not apply to tritium, krypton-85, or promethium-147 used in products primarily for frivolous purposes or in toys or adornments.
  - (b) Radium-226. Any person is exempt from these regulations to the extent that such person receives, possesses, uses, transfers, or owns articles containing less than 0.1 microcurie of radium-226 which were acquired prior to the effective date of these regulations.
- (3) Gas and Aerosol Detectors Containing Radioactive Material.
- (a) Except for persons who manufacture, process, or produce gas and aerosol detectors containing radioactive material, any person is exempt from these regulations to the extent that such person receives, possesses, uses, transfers, owns, or acquires radioactive material in gas and aerosol detectors designed to protect life or property from fires and airborne hazards provided that detectors containing radioactive material shall have been manufactured, imported, or transferred in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission <sup>5/</sup> pursuant to Section 32.26 of 10 CFR Part 32; or a Licensing State pursuant to C.11.C, which authorizes the transfer of the detectors to persons who are exempt from regulatory requirements.
  - (b) Gas and aerosol detectors previously manufactured and distributed to general licensees in accordance with a specific license issued by an Agreement State shall be considered exempt under C.3.C(3)(a), provided that the device is labeled in accordance with the specific license authorizing distribution of the generally licensed device, and provided further that they meet the requirements of C.11.C.
  - (c) Gas and aerosol detectors containing NARM previously manufactured and distributed in accordance with a specific license issued by a Licensing State shall be considered exempt under C.3.C(3)(a), provided that the device is labeled in accordance with the specific license authorizing distribution, and provided further that they meet the requirements of C.11.C.
- (4) Resins Containing Scandium-46 and Designed for Sand Consolidation in Oil Wells. Any person is exempt from these regulations to the extent that such person receives, possesses, uses, transfers, owns or acquires synthetic plastic resins containing scandium-46 which are designed for sand consolidation in oil wells. Such resins shall have been manufactured or imported in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission, or shall have been manufactured in accordance with the specifications contained in a specific license issued by the Agency or any Agreement State to the manufacturer of such resins pursuant to licensing requirements equivalent to those in Sections 32.16 and 32.17 of 10 CFR Part 32 of the regulations of the U.S. Nuclear Regulatory Commission. This exemption does not authorize the manufacture of any resins containing scandium-46.

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<sup>5/</sup> Authority to transfer possession or control by the manufacturer, processor or producer of any equipment, device, commodity, or other product containing byproduct material whose subsequent possession, use, transfer, and disposal by all other persons are exempted from regulatory requirements may be obtained only from the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

- (5) Radioactive drug: Capsules containing carbon-14 urea for “in-vivo” diagnostic use for humans.
- (a) Except as provided in paragraphs (b) and (c) of this section, any person is exempt from the requirements for a license set forth in the regulations in this part and part G of 10-144A CMR 220, provided that such person receives, possesses, uses, transfers, owns, or acquires capsules containing 37 kBq (1 uCi) carbon-14 urea (allowing for nominal variation that may occur during the manufacturing process) each, for “in-vivo” diagnostic use for humans.
  - (b) Any person who desires to use the capsules for research involving human subjects shall apply for and receive a specific license pursuant to part G of 10-144A CMR 220.
  - (c) Any person who desires to manufacture, prepare, process, produce, package, repackage, or transfer for commercial distribution such capsule shall apply for and receive a specific license pursuant to C.7 of this part.
  - (d) Nothing in this section relieves persons from complying with applicable FDA, other Federal, and State requirements governing receipt, administration, and use of drugs.

## LICENSES

- 4. Types of Licenses.** Licenses for radioactive materials are of two types: general and specific.
- A. General licenses provided in this part are effective without the filing of applications with the Agency or the issuance of licensing documents to the particular person, although the filing of a certificate with the Agency may be required by the particular general license. The general licensee is subject to all other applicable portions of these regulations and any limitations of the general license.
  - B. Specific licenses require the submission of an application to the Agency and the issuance of a licensing document by the Agency. The licensee is subject to all applicable portions of these regulations as well as any limitations specified in the licensing document.

## GENERAL LICENSES

- 5. General Licenses - Source Material.**
- A. A general license is hereby issued authorizing commercial and industrial firms, research, educational and medical institutions, and State and local government agencies to use and transfer not more than 15 pounds (6.82 kg) of source material at any one time for research, development, educational, commercial or operational purposes. A person authorized to use or transfer source material, pursuant to this general license may not receive more than a total of 150 pounds (68.2 kg) of source material in any one calendar year.
  - B. Persons who receive, possess, use, or transfer source material pursuant to the general license issued in C.5.A. are exempt from the provisions of Parts D and J of these regulations to the extent that such receipt, possession, use, or transfer is within the terms of such general license; provided, however, that this exemption shall not be deemed to apply to any such person who is also in possession of source material under a specific license issued pursuant to this part.
  - C. Persons who receive, possess, use, or transfer source material pursuant to the general license in C.5.A. are prohibited from administering source material, or the radiation therefrom, either externally or internally, to human beings except as may be authorized by the Agency in a specific license.
  - D. A general license is hereby issued authorizing the receipt of title to source material without regard to quantity. This general license does not authorize any person to receive, possess, use, or transfer source material.

## E. Depleted Uranium in Industrial Products and Devices.

- (1) A general license is hereby issued to receive, acquire, possess, use, or transfer, in accordance with the provisions of C.5.D(2), (3), (4), and (5), depleted uranium contained in industrial products or devices for the purpose of providing a concentrated mass in a small volume of the product or device.
- (2) The general license in C.5.E(1). applies only to industrial products or devices which have been manufactured either in accordance with a specific license issued to the manufacturer of the products or devices pursuant to C.11.L. or in accordance with a specific license issued to the manufacturer by the U.S. Nuclear Regulatory Commission or an Agreement State which authorizes manufacture of the products or devices for distribution to persons generally licensed by the U.S. Nuclear Regulatory Commission or an Agreement State.
- (3) (a) Persons who receive, acquire, possess, or use depleted uranium pursuant to the general license established by C.5.D(1) shall file Agency Form HHE 860 "Registration Certificate - Use of Depleted Uranium Under General License," with the Agency and pay the registration fee referenced in Appendix A of this Part. The form shall be submitted within 30 days after the first receipt or acquisition of such depleted uranium or 30 days after the effective date of these regulations for depleted uranium acquired prior to the effective date. The registrant shall furnish on Agency Form HHE 860 the following information and such other information as may be required by that form:
  - (i) name and address of the registrant;
  - (ii) a statement that the registrant has developed and will maintain procedures designed to establish physical control over the depleted uranium described in C.5.D(1). and designed to prevent transfer of such depleted uranium in any form, including metal scrap, to persons not authorized to receive the depleted uranium; and
  - (iii) name and/or title, address, and telephone number of the individual duly authorized to act for and on behalf of the registrant in supervising the procedures identified in C.5.D(3)(a)(ii).
- (b) The registrant possessing or using depleted uranium under the general license established by C.5.D(1). shall report in writing to the Agency any changes in information furnished by him in Agency Form HHE 860 "Registration Certificate - Use of Depleted Uranium Under General License." The report shall be submitted within 30 days after the effective date of such change.
- (4) A person who receives, acquires, possesses, or uses depleted uranium pursuant to the general license established by C.5.E(1):
  - (a) Shall not introduce such depleted uranium, in any form, into a chemical, physical, or metallurgical treatment or process, except a treatment or process for repair or restoration of any plating or other covering of the depleted uranium.
  - (b) Shall not abandon such depleted uranium.
  - (c) Shall transfer or dispose of such depleted uranium only by transfer in accordance with the provisions of C.21. In the case where the transferee receives the depleted uranium pursuant to the general license established by C.5.E(1), the transferor shall furnish the transferee a copy of this regulation and a copy of Agency Form HHE 860. In the case where the transferee receives the depleted uranium pursuant to a general license contained in the U.S. Nuclear Regulatory Commission's or Agreement State's regulations equivalent to C.5.E(1)., the transferor shall furnish the transferee a copy of this regulation and a copy of Agency Form HHE 860 accompanied by a note explaining that use of the product or device is regulated by the U.S. Nuclear Regulatory Commission or Agreement State under requirements substantially the same as those in this regulation.

- (d) Within 30 days of any transfer, shall report in writing to the Agency the name and address of the person receiving the depleted uranium pursuant to such transfer.
  - (e) Shall not export such depleted uranium except in accordance with the license issued by the U.S. Nuclear Regulatory Commission pursuant to 10 CFR Part 110.
- (5) Any person receiving, acquiring, possessing, using, or transferring depleted uranium pursuant to the general license established by C.5.E(1). is exempt from the requirements of Parts D and J of these regulations with respect to the depleted uranium covered by that general license.

## 6. General Licenses - Radioactive Material Other Than Source Material.

A. Certain Devices and Equipment. A general license is hereby issued to transfer, receive, acquire, own, possess, and use radioactive material incorporated in the following devices or equipment which have been manufactured, tested and labeled by the manufacturer in accordance with a specific license issued to the manufacturer by the U.S. Nuclear Regulatory Commission for use pursuant to Section 31.3 of 10 CFR Part 31. This general license is subject to the provisions of A.4 through A.9, C.3.A(2), C.14, C.21, C.22, and Parts D, J and L of these regulations.

- (1) Static Elimination Device. Devices designed for use as static eliminators, which contain, as a sealed source or sources, radioactive material consisting of a total of not more than 500 microcuries of polonium-210 per device.
- (2) Ion Generating Tube. Devices designed for ionization of air which contain, as a sealed source or sources, radioactive material consisting of a total of not more than 500 microcuries of polonium-210 per device or a total of not more than 50 millicuries of hydrogen-3 (tritium) per device.

B. Certain Measuring, Gauging or Controlling Devices.

- (1) A general license is hereby issued to commercial and industrial firms and to research, educational and medical institutions, individuals in the conduct of their business, and State or local government agencies to own, receive, acquire, possess, use or transfer in accordance with the provision of C.6.B(2), (3), (4), radioactive material, excluding special nuclear material, contained in devices designed and manufactured for the purpose of detecting, measuring, gauging or controlling thickness, density, level, interface location, radiation, leakage, or qualitative or quantitative chemical composition, or for producing light or an ionized atmosphere.
- (2) The general license in C.6.B(1) applies only to radioactive material contained in devices, which have been manufactured and labeled in accordance with the specifications contained in a specific license issued by the Agency pursuant to C.11.D or in accordance with the specifications contained in a specific license issued by the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State, which authorizes distribution of devices to persons generally licensed by the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State. Regulations under the Federal Food, Drug, and Cosmetic Act authorizing the use of radioactive control devices in food production require certain additional labeling thereon which is found in Section 179.21 of the Code of Federal Regulations, Title 21.
- (3) Any person who owns, receives, acquires, possesses, uses, or transfers radioactive material in a device pursuant to the general license in C.6.B(1) shall file Agency Form HHE 861 "Registration Certificate - Use of Fixed Measuring, Gauging or Controlling Devices" or Agency Form HHE 862 "Registration Certificate - Use of Portable Measuring, Gauging or Controlling Devices" with the Agency. The form shall be submitted within 30 days after the first receipt or acquisition of such device or 30 days after the effective date of these regulations for devices acquired prior to the effective date. The general licensee shall furnish such information as may be required by that form as well as the annual fee referenced in Appendix A of this Part and:

- (a) shall assure that all labels affixed to the device at the time of receipt, and bearing a statement that removal of the label is prohibited, are maintained thereon and shall comply with all instructions and precautions provided by such labels;
- (b) shall assure that the device is tested for leakage of radioactive material and proper operation of the on-off mechanism and indicator, if any, at no longer than six-month intervals or at such other intervals as are specified in the label, however,
  - (i) devices containing only krypton need not be tested for leakage of radioactive material, and
  - (ii) devices containing only tritium or not more than 100 microcuries of other beta and/or gamma emitting material or 10 microcuries of alpha emitting material and devices held in storage in the original shipping container prior to initial installation need not be tested for any purpose;
- (c) shall assure that other testing, installation, servicing, and removal from installation involving the radioactive materials, its shielding or containment, are performed:
  - (i) in accordance with the instructions provided by the labels, or
  - (ii) by a person holding an applicable specific license from the Agency, the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State to perform such activities;
- (d) shall maintain records showing compliance with the requirements of C.6.B(3)(b) and (c). The records shall show the results of tests. The records also shall show the dates of performance of, and the names of persons performing, testing, installation, servicing, and removal from installation concerning the radioactive material, its shielding or containment. Records of tests for leakage of radioactive material required by C.6.B(3)(b) shall be maintained for 1 year after the next required leak test is performed or until the sealed source is transferred or disposed. Records of tests of the on/off mechanism and indicator required by C.6.B(3)(b) shall be maintained for 1 year after the next required test of the on/off mechanism and indicator is performed or until the sealed source is transferred or disposed. Records which are required by C.6.B(3)(c). shall be maintained for a period of 2 years from the date of the recorded event or until the device is transferred or disposed;
- (e) upon the occurrence of a failure of or damage to, or any indication of a possible failure of or damage to, the shielding of the radioactive material or the on-off mechanism or indicator, or upon the detection of 0.005 microcurie or more removable radioactive material, shall immediately suspend operation of the device until it has been repaired by the manufacturer or other person holding an applicable specific license from the Agency, the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State to repair such devices, or disposed of by transfer to a person authorized by an applicable specific license to receive the radioactive material contained in the device and, within 30 days, furnish to the Agency a report containing a brief description of the event and the remedial action taken;
- (f) shall not abandon the device containing radioactive material;
- (g) except as provided in C.6.B(3)(h), shall transfer or dispose of the device containing radioactive material only by transfer to a specific licensee of the Agency, the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State whose specific license authorizes him to receive the device and within 30 days after transfer of a device to a specific licensee shall furnish to the Agency a report containing identification of the device by manufacturer's name and model number and the name and address of the person receiving the device. No report is required if the device is transferred to the specific licensee in order to obtain a replacement device;

- (h) shall transfer the device to another general licensee only:
  - (i) where the device remains in use at a particular location. In such case the transferor shall give the transferee a copy of this regulation and any safety documents identified in the label on the device and within 30 days of the transfer, report to the Agency the manufacturer's name and model number of device transferred, the name and address of the transferee, and the name and/or position of an individual who may constitute a point of contact between the Agency and the transferee; or
  - (ii) where the device is held in storage in the original shipping container at its intended location of use prior to initial use by a general licensee; and
- (j) shall comply with the provisions of D.51. and D.52. of these regulations for reporting radiation incidents, theft, or loss of licensed material, but shall be exempt from the other requirements of Parts D and J of these regulations.
- (4) The general license in C.6.B.(1) does not authorize the manufacture of devices containing radioactive material.
- (5) The general license provided in C.6.B.(1) is subject to the provisions of A.4 through A.9., C.14., C.21., C.22. and Part L of these regulations.

**C. Luminous Safety Devices for Aircraft.**

- (1) A general license is hereby issued to own, receive, acquire, possess, and use tritium or promethium-147 contained in luminous safety devices for use in aircraft, provided:
  - (a) each device contains not more than 10 curies of tritium or 300 millicuries of promethium-147; and
  - (b) each device has been manufactured, assembled or imported in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission, or each device has been manufactured or assembled in accordance with the specifications contained in a specific license issued by the Agency or any Agreement State to the manufacturer or assembler of such device pursuant to licensing requirements equivalent to those in Section 32.53 of 10 CFR Part 32 of the regulations of the U.S. Nuclear Regulatory Commission.
- (2) Persons who own, receive, acquire, possess, or use luminous safety devices pursuant to the general license in C.6.C.1. are exempt from the requirements of Part D and Part J of these regulations except that they shall comply with the provisions of D.51. and D.52.
- (3) This general license does not authorize the manufacture, assembly, or repair of luminous safety devices containing tritium or promethium-147.
- (4) This general license does not authorize the ownership, receipt, acquisition, possession or use of promethium-147 contained in instrument dials.
- (5) This general license is subject to the provisions of A.4. through A.9., C.14., C.21., C.22. and Part L of these regulations.

**D. Ownership of Radioactive Material.** A general license is hereby issued to own radioactive material without regard to quantity. Notwithstanding any other provisions of this part, this general license does not authorize the manufacture, production, transfer, receipt, possession or use of radioactive material.

## E. Calibration and Reference Sources.

- (1) A general license is hereby issued to those persons listed below to own, receive, acquire, possess, use, and transfer, in accordance with the provisions of C.6.E. (4) and (5), americium-241 in the form of calibration or reference sources:
- (a) Any person who holds a specific license issued by the Agency which authorizes him to receive, possess, use, and transfer radioactive material; and
  - (b) any person who holds a specific license issued by the U.S. Nuclear Regulatory Commission which authorizes him to receive, possess, use, and transfer special nuclear material.
- (2) A general license is hereby issued to own, receive, possess, use, and transfer plutonium in the form of calibration or reference sources in accordance with the provisions of C.6.E. (4) and (5) to any person who holds a specific license issued by the Agency which authorizes him to receive, possess, use, and transfer radioactive material.
- (3) A general license is hereby issued to own, receive, possess, use, and transfer radium-226 in the form of calibration or reference sources in accordance with the provisions of C.6.E. (4) and (5) to any person who holds a specific license issued by the Agency which authorizes him to receive, possess, use, and transfer radioactive material.
- (4) The general licenses in C.6.E.(1),(2) and (3) apply only to calibration or reference sources which have been manufactured in accordance with the specifications contained in a specific license issued to the manufacturer or importer of the sources by the U.S. Nuclear Regulatory Commission pursuant to Section 32.57 of 10 CFR Part 32 or Section 70.39 of 10 CFR Part 70 or which have been manufactured in accordance with the specifications contained in a specific license issued to the manufacturer by the Agency, any Agreement State or Licensing State pursuant to licensing requirements equivalent to those contained in Section 32.57 of 10 CFR Part 32 or Section 70.39 of 10 CFR Part 70 of the regulations of the U.S. Nuclear Regulatory Commission.
- (5) The general licenses provided in C.6.E(1), (2) and (3) are subject to the provisions of A.4 through A.9, C.14, C.21, C.22, and Parts D, J and L of these regulations. In addition, persons who own, receive, acquire, possess, use, or transfer one or more calibration or reference sources pursuant to these general licenses:
- (a) shall not possess at any one time, at any one location of storage or use, more than 5 microcuries of americium-241, 5 microcuries of plutonium, or 5 microcuries of radium-226 in such sources;
  - (b) shall not receive, possess, use, or transfer such source unless the source, or the storage container, bears a label which includes one of the following statements, as appropriate, or a substantially similar statement which contains the information called for in one of the following statements, as appropriate:
    - (i) The receipt, possession, use and transfer of this source, Model\_\_\_\_\_, Serial No.\_\_\_\_\_, are subject to a general license and the regulations of the U.S. Nuclear Regulatory Commission or of a State with which the Commission has entered into an agreement for the exercise of regulatory authority. Do not remove this label.

**CAUTION - RADIOACTIVE MATERIAL - THIS SOURCE CONTAINS  
(AMERICIUM-241). (PLUTONIUM)<sup>6</sup> /  
DO NOT TOUCH RADIOACTIVE PORTION OF THIS SOURCE.  
(Name of manufacturer or importer)**

<sup>6</sup> / Showing only the name of the appropriate material

- (ii) The receipt, possession, use and transfer of this source, Model\_\_\_\_\_, Serial No.\_\_\_\_\_, are subject to a general license and the regulations of any Licensing State. Do not remove this label.

**CAUTION - RADIOACTIVE MATERIAL - THIS SOURCE CONTAINS RADIUM-226.  
DO NOT TOUCH RADIOACTIVE PORTION OF THIS SOURCE.**

(Name of manufacturer or importer)

- (c) shall not transfer, abandon, or dispose of such source except by transfer to a person authorized by a license from the Agency, the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State to receive the source;
- (d) shall store such source, except when the source is being used, in a closed container adequately designed and constructed to contain americium-241, plutonium, or radium-226 which might otherwise escape during storage; and
- (e) shall not use such source for any purpose other than the calibration of radiation detectors or the standardization of other sources.
- (6) These general licenses do not authorize the manufacture of calibration or reference sources containing americium-241, plutonium, or radium-226.

**F. General License for Use of Radioactive Material for Certain *In- Vitro* Clinical or Laboratory Testing.**

- (1) A general license is hereby issued to any physician, veterinarian, clinical laboratory or hospital to receive, acquire, possess, transfer or use, for any of the following stated tests, in accordance with the provisions of C.6.F. (2), (3), (4), (5), and (6), the following radioactive materials in prepackaged units for use in *in-vitro* clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation therefrom, to human beings or animals:
- (a) Iodine-125, in units not exceeding 10 microcuries each;
  - (b) Iodine-131, in units not exceeding 10 microcuries each;
  - (c) Carbon-14, in units not exceeding 10 microcuries each;
  - (d) Hydrogen-3 (tritium), in units not exceeding 50 microcuries each;
  - (e) Iron-59, in units not exceeding 20 microcuries each;
  - (f) Cobalt-57, in units not exceeding 10 microcuries each;
  - (g) Selenium-75, in units not exceeding 10 microcuries each;
  - (h) Mock Iodine-125 reference or calibration sources, in units not exceeding 0.05 microcurie of iodine-129 and 0.005 microcurie of americium-241 each;
- (2) No person shall receive, acquire, possess, use or transfer radioactive material pursuant to the general license established by C.6.F.(1). until he has filed Agency Form HHE 863, "Certificate- In Vitro Testing with Radioactive Material Under General License", with the Agency as well as the registration fee referenced in Appendix A to this Part and received from the Agency a validated copy of Agency Form HHE 863 with certification number assigned. The physician, veterinarian, clinical laboratory or hospital shall furnish on Agency Form HHE 863 the following information and such other information as may be required by that form:

- (a) Name and address of the physician, veterinarian, clinical laboratory or hospital;
  - (b) the location of use; and
  - (c) a statement that the physician, veterinarian, clinical laboratory or hospital has appropriate radiation measuring instruments to carry out *in-vitro* clinical or laboratory tests with radioactive material as authorized under the general license in C.6.F.(1). and that such tests will be performed only by personnel competent in the use of such instruments and in the handling of the radioactive material.
- (3) A person who receives, acquires, possesses or uses radioactive material pursuant to the general license established by C.6.F.(1). shall comply with the following:
- (a) The general licensee shall not possess at any one time, pursuant to the general license in C.6.F.(1)., at any one location of storage or use, a total amount of iodine-125, iodine-131, selenium-75, iron-59, and/or cobalt-57 in excess of 200 microcuries.
  - (b) The general licensee shall store the radioactive material, until used, in the original shipping container or in a container providing equivalent radiation protection.
  - (c) The general licensee shall use the radioactive material only for the uses authorized by C.6.F.(1).
  - (d) The general licensee shall not transfer the radioactive material to a person who is not authorized to receive it pursuant to a license issued by the Agency, the U.S. Nuclear Regulatory Commission, any Agreement State or Licensing State, nor transfer the radioactive material in any manner other than in the unopened, labeled shipping container as received from the supplier.
  - (e) The general licensee shall dispose of the Mock Iodine-125 reference or calibration sources described in C.6.F.(1). as required by D.16. of these regulations.
- (4) The general licensee shall not receive, acquire, possess, or use radioactive material pursuant to C.6.F.(1).:
- (a) Except as prepackaged units, which are labeled in accordance with the provisions of an applicable specific license, issued pursuant to C.11.G. or in accordance with the provisions of a specific license issued by the U.S. Nuclear Regulatory Commission, any Agreement State or Licensing State which authorizes the manufacture and distribution of iodine-125, iodine-131, carbon-14, hydrogen-3 (tritium), iron-59, selenium-75, cobalt-57, or Mock Iodine-125 to persons generally licensed under C.6.F or its equivalent, and
  - (b) unless one of the following statements, as appropriate, or a substantially similar statement which contains the information called for in one of the following statements, appears on a label affixed to each prepackaged unit or appears in a leaflet or brochure which accompanies the package:
    - (i) This radioactive material shall be received, acquired, possessed and used only by physicians, veterinarians, clinical laboratories or hospitals and only for *in-vitro* clinical or laboratory tests not involving internal or external administration of the material, or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use, and transfer are subject to the regulations and a general license of the U.S. Nuclear Regulatory Commission or of a State with which the Commission has entered into an agreement for the exercise of regulatory authority.  
( Name of manufacturer)

(ii) This radioactive material shall be received, acquired, possessed and used only by physicians, veterinarians, clinical laboratories or hospitals and only for *in-vitro* clinical or laboratory tests not involving internal or external administration of the material, or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use and transfer are subject to the regulations and a general license of a Licensing State.

(Name of manufacturer)

- (5) The physician, veterinarian, clinical laboratory or hospital possessing or using radioactive material under the general license of C.6.F.1. shall report in writing to the Agency, any changes in the information furnished by him in the "Certificate - In-Vitro Testing with Radioactive Material Under General License", Agency Form HHE 880. The report shall be furnished within 30 days after the effective date of such change.
- (6) Any person using radioactive material pursuant to the general license of C.6.F.(1). is exempt from the requirements of Part D and Part J of these regulations with respect to radioactive material covered by that general license, except that such persons using the Mock Iodine-125 described in C.6.F.(1). shall comply with the provisions of D.16, D.28, and D.29 of these regulations.

G. Ice Detection Devices.

- (1) A general license is hereby issued to own, receive, acquire, possess, use, and transfer strontium-90 contained in ice detection devices, provided each device contains not more than 50 microcuries of strontium-90 and each device has been manufactured or imported in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission or each device has been manufactured in accordance with the specifications contained in a specific license issued by the Agency or any Agreement State to the manufacturer of such device pursuant to the licensing requirements equivalent to those in Section 32.61 of 10 CFR Part 32 of the regulations of the U.S. Nuclear Regulatory Commission.
- (2) Persons who own, receive, acquire, possess, use, or transfer strontium-90 contained in ice detection devices pursuant to the general license in C.6.G.(1).,
  - (a) shall, upon occurrence of visually observable damage, such as a bend or crack or discoloration from overheating to the device, discontinue use of the device until it has been inspected, tested for leakage and repaired by a person holding a specific license from the U.S. Nuclear Regulatory Commission or an Agreement State to manufacture or service such devices; or shall dispose of the device pursuant to the provisions of D.16 of these regulations;
  - (b) shall assure that all labels affixed to the device at the time of receipt, and which bear a statement which prohibits removal of the labels, are maintained thereon; and
  - (c) are exempt from the requirements of Part D and Part J of these regulations except that such person shall comply with the provisions of D.33, D.51, and D.52.
- (3) This general license does not authorize the manufacture, assembly, disassembly or repair of strontium-90 in ice detection devices.
- (4) This general license is subject to the provisions of A.4., through A.9., C.14., C.21., C.22., and Part L of these regulations.

## SPECIFIC LICENSES

### 7. Filing Application for Specific Licenses.

- A. Applications for specific license shall be filed on a form prescribed by the Agency.
- B. The Agency may at any time after the filing of the original application, and before the expiration of the license, require further statements in order to enable the Agency to determine whether the license should be modified or revoked.
- C. Each application shall be signed by the applicant or licensee or a person duly authorized to act for and on their behalf.
- D. An application for a license may include a request for a license authorizing one or more activities.
- E. All sections of the application must be completed, clearly and concisely, with the applicable required information.
- F. Applications and documents submitted to the Agency may be made available for public inspection except that the Agency may withhold any document or part thereof from public inspection if disclosure of its content is not required in the public interest and would adversely affect the interest of a person concerned.
- G. Emergency Planning
  - (1) Each application to possess radioactive materials in unsealed form, on foils or plated sources, or sealed in glass in excess of the quantities in "Schedule D -- Quantities of Radioactive Materials Requiring Consideration of the Need for an Emergency Plan for Responding to a Release," must contain either:
    - (a) An evaluation showing that the maximum dose to a person offsite due to a release of radioactive materials would not exceed 1 rem effective dose equivalent or 5 rems to the thyroid or an intake of 2 milligrams of soluble uranium; or
    - (b) An emergency plan for responding to a release of any radioactive material and to any associated chemical hazards directly incident thereto.
  - (2) One or more of the following factors may be used to support an evaluation submitted under paragraph G.1.(a) of this section:
    - (a) The radioactive material is physically separated so that only a portion could be involved in an accident;
    - (b) All or part of the radioactive material is not subject to release during an accident because of the way it is stored or packaged;
    - (c) The release fraction in the respirable size range would be lower than the release fraction shown in Schedule D due to the chemical or physical form of the material;
    - (d) The solubility of the radioactive material would reduce the dose received;
    - (e) Facility design or engineered safety features in the facility would cause the release fraction to be lower than shown in Schedule D;
    - (f) Operating restrictions or procedures would prevent a release fraction as large as that shown in Schedule D;  
or
    - (g) Other factors appropriate for the specific facility.

- (3) An emergency plan for responding to a release of radioactive material submitted under paragraph G.1.(a) of this section must include the following information:
- (a) Facility description. A brief description of the licensee's facility and area near the site.
  - (b) Types of accidents. An identification of each type of radio-active materials accident for which protective actions may be needed.
  - (c) Classification of accidents. A classification system for classifying accidents as alerts or site area emergencies.
  - (d) Detection of accidents. Identification of the means of detecting each type of accident in a timely manner.
  - (e) Mitigation of consequences. A brief description of the means and equipment for mitigating the consequences of each type of accident, including those provided to protect workers onsite, and a description of the program for maintaining the equipment.
  - (f) Assessment of releases. A brief description of the methods and equipment to assess releases of radioactive materials.
  - (g) Responsibilities. A brief description of the responsibilities of licensee personnel should an accident occur, including identification of personnel responsible for promptly notifying offsite response organizations and the Agency; also responsibilities for developing, maintaining, and updating the plan.
  - (h) Notification and coordination. A commitment to and a brief description of the means to promptly notify offsite response organizations and request offsite assistance, including medical assistance for the treatment of contaminated injured onsite workers when appropriate. A control point must be established. The notification and coordination must be planned so that unavailability of some personnel, parts of the facility, and some equipment will not prevent the notification and coordination. The licensee shall also commit to notify this Agency immediately after notification of the appropriate offsite response organizations and not later than one hour after the licensee declares an emergency.
  - (i) Information to be communicated. A brief description of the types of information on facility status, radioactive releases, and recommended protective actions, if necessary, to be given to offsite response organizations and to the Agency.
  - (j) Training. A brief description of the frequency, performance objectives and plans for the training that the licensee will provide workers on how to respond to an emergency including any special instructions and orientation tours the licensee would offer to fire, police, medical and other emergency personnel. The training shall familiarize personnel with site-specific emergency procedures. Also, the training shall thoroughly prepare site personnel for their responsibilities in the event of accident scenarios postulated as most probable for the specific site, including the use of team training for such scenarios.
  - (k) Safe shutdown. A brief description of the means of restoring the facility to a safe condition after an accident.

(l) Exercises. Provisions for conducting quarterly communications checks with offsite response organizations and biennial onsite exercises to test response to simulated emergencies. Quarterly communications checks with offsite response organizations must include the check and update of all necessary telephone numbers. The licensee shall invite offsite response organizations to participate in the biennial exercises. Participation of offsite response organizations in biennial exercises although recommended is not required. Exercises must use accident scenarios postulated as most probable for the specific site and the scenarios shall not be known to most exercise participants. The licensee shall critique each exercise using individuals not having direct implementation responsibility for the plan. Critiques of exercises must evaluate the appropriateness of the plan, emergency procedures, facilities, equipment, training of personnel, and overall effectiveness of the response. Deficiencies found by the critiques must be corrected.

(m) Hazardous chemicals. A certification that the applicant has met its responsibilities under the Emergency Planning and Community Right-to-Know Act of 1986, title III, Pub. L. 99 - 499, if applicable to the applicant's activities at the proposed place of use of the byproduct material.

(4) The licensee shall allow the offsite response organizations expected to respond in case of an accident 60 days to comment on the licensee's emergency plan before submitting it the Agency. The licensee shall provide any comments received within the 60 days to the Agency with the emergency plan.

**8. General Requirements for the Issuance of Specific Licenses. A license application will be approved if the Agency determines that:**

- A. The applicant is qualified by reason of training and experience to use the material in question for the purpose requested in accordance with these regulations in such a manner as to minimize danger to public health and safety or property;
- B. The applicant's proposed equipment, facilities, and procedures are adequate to minimize danger to public health and safety or property;
- C. The issuance of the license will not be inimical to the health and safety of the public; and
- D. The applicant satisfies any applicable special requirements in C.9, C.10. or C.11. and Part E, Part G, and Part K of these regulations.
- E. Environmental Report, Commencement of Construction. In the case of an application for a license to receive and possess radioactive material for commercial waste disposal by land burial, source material milling, or for the conduct of any other activity which the Agency determines will significantly affect the quality of the environment, the Agency, before commencement of construction of the plant or facility in which the activity will be conducted, has concluded, after weighing the environmental, economic, technical and other benefits against environmental costs and considering available alternatives, that the action called for is the issuance of the proposed license, with any appropriate conditions to protect environmental values. Commencement of construction prior to such conclusion shall be grounds for denial of a license to receive and possess radioactive material in such plant or facility. As used in this paragraph the term "commencement of construction" means any clearing of land, excavation, or other substantial action that would adversely affect the environment of a site. The term does not mean site exploration, necessary roads for site exploration, borings to determine foundation conditions, or other preconstruction monitoring or testing to establish background information related to the suitability of the site or the protection of environmental values.

F. Financial Surety for Decommissioning, Recovery or Site Reclamation.

- (1) Each applicant for a specific license authorizing the possession and use of special nuclear material, source material, or byproduct material in quantities and amounts in excess of those indicated in Table F.1 shall submit a decommissioning funding plan in the event of planned or unplanned decommissioning, recovery, or site reclamation. The decommissioning funding plan must also be submitted when a combination of isotopes is involved if  $R$  divided by  $10^5$  is greater than 1 (unity rule), where  $R$  is defined here as the sum of the ratios of quantity of each isotope to the applicable value in Part C, Appendix E.

TABLE F.1

Type	Exceeding
Special Nuclear Material	$10^5$ times Part C, App. E
Source Material	100 $\mu$ Ci in readily dispersible form
Byproduct Material	Half-life greater than 120 days and $10^5$ times Part C, App. E

- (2) Each applicant for or holder of a specific license authorizing possession and use of special nuclear material, source material, or byproduct material in excess of those indicated in Table F.2 shall either:
- (a) Submit a decommissioning funding plan as described in paragraph (4) of this section; or
  - (b) Submit a certification that financial assurance for decommissioning has been provided in the amount prescribed by Table F.2 of this section using one of the methods described in paragraph (4) of this section. For an applicant, this certification may state that the appropriate assurance will be obtained after the application has been approved and the license issued but prior to the receipt of licensed material.
- (3) Each funding plan must contain a cost estimate for decommissioning, recovery or reclamation, and a description of the method of assuring funds for such including means of adjusting cost estimates and associated funding levels over the life of the facility.

TABLE F.2

Type of Radioactive Material	Exceeding	Assurance Amount
<u>Special Nuclear</u>	Greater than $10^4$ but less than or equal to $10^5$ times the applicable quantities*	\$500,000
	Greater than $10^3$ but less than or equal to $10^4$ times the applicable quantities*	\$100,000
<u>Source Material</u>	Greater than 10 mCi but less than or equal to 100 mCi in a readily dispersible form	\$150,000
<u>Byproduct Material</u>	Half life greater than 120 days and in quantities:	
	Greater than $10^4$ but less than or equal to $10^5$ times the applicable quantities in unsealed form*	\$750,000
	Greater than $10^3$ but less than or equal to $10^4$ times the applicable quantities in unsealed form*	\$150,000
	Greater than $10^{10}$ times the applicable quantities in sealed sources	\$75,000

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\*\*As indicated in Part C, App. E

(4) Financial assurance must be provided by one or more of the following methods:

- (a) Prepayment. Prepayment is the deposit prior to the start of operation into an account segregated from licensee assets and outside the licensee's administrative control of cash or liquid assets that will retain their value over the projected operating life of the facility and that are in an amount such that the principal plus accumulated earnings would be sufficient to pay the necessary costs. Prepayment may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities.

- (b) A surety method insurance, or other guarantee method. These methods guarantee that decommissioning costs will be paid. A surety method may be in the form of a surety bond, letter of credit, or line of credit. A parent company guarantee of funds for decommissioning costs based on a financial test may be used if the guarantee and test are contained in Appendix C of this Part. A parent company guarantee may not be used in combination with other financial methods to satisfy the requirements of this section. A guarantee of funds by the applicant or licensee for decommissioning costs based on a financial test are as contained in Appendix D of this Part. A guarantee by the applicant or licensee may not be used in combination with any other financial methods to satisfy the requirements of this section or in any other situation where the applicant or licensee has a parent company holding majority control of the voting stock of the company. Any surety method or insurance used to provide financial assurance must contain the following conditions:
- (i) The surety or insurance must be open-ended or, if written for a specified term, such as five years, must be renewed automatically unless 90 days or more prior to the renewal date, the issuer notifies the Agency, the beneficiary, and the licensee of its intention not to renew. The surety or insurance must also provide that the beneficiary may automatically collect prior to the expiration without proof of forfeiture if the licensee fails to provide a replacement acceptable to the Agency within 30 days after receipt of notification of cancellation.
  - (ii) The beneficiary of the surety or insurance must be a trustee acceptable to the Agency such as an appropriate state or Federal government agency or a major financial organization.
  - (iii) The surety or insurance must remain in effect until the Agency has terminated the license.
- (c) An external sinking fund in which deposits are made at least annually, coupled with a surety method or insurance, the value of which may decrease by the amount being accumulated in the sinking fund. An external sinking fund is a fund established and maintained by the periodic deposit of a prescribed amount into an account segregated from licensee assets and outside the licensee's administrative control in which the total amount of the periodic deposits plus accumulated earnings would be sufficient to pay the necessary costs at the time termination of operation is expected. An external sinking fund may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities.
- (d) In the case of State, or local government licensees, a certification that the appropriate government entity will be guarantor of funds.
- (e) Other funding methods, which are demonstrated by the applicant or licensee to provide comparable assurance to methods, listed in paragraphs (4)(a) through (c) of this section.
- (f) Each person licensed under this Part shall keep records of information important to the safe and effective decommissioning of the facility in an identified location until the license is terminated by the Agency. If records of relevant information are kept for other purposes, reference to these records and their locations may be used. Information the Agency considers important to decommissioning consists of:
- (i) Records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site. These records may be limited to instances when contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete.

These records must include any known information on identification of involved nuclides, quantities, forms, and concentrations.

- (ii) As-built drawings and modifications of structures and equipment in restricted areas where radioactive materials are used and/or stored, and of locations of possible inaccessible contamination such as buried pipes, which may be subject to contamination. If required drawings are referenced, each relevant document need not be indexed individually. If drawings are not available, the licensee shall substitute appropriate records of available information concerning these areas and locations.
- (iii) Except for areas containing only sealed sources (provided the sources have not leaked or no contamination remains after any leak) or byproduct materials having only half-lives of less than 65 days, a list contained in a single document and updated every 2 years, of the following:
  - (1) All areas designated and formerly designated restricted areas as defined in D.3;
  - (2) All areas outside of restricted areas that require documentation under C.8.F.(4)(f)(i);
  - (3) All areas outside of restricted areas where current and previous wastes have been buried as documented under D.48; and
  - (4) All areas outside of restricted areas that contain material such that, if the license expired, the licensee would be required to either decontaminate the area to meet the criteria for decommissioning in Part D or apply for approval for disposal under D.34.
- (iv) Records of the cost estimate performed for the decommissioning funding plan or of the amount certified for decommissioning, and records of the funding method used for assuring funds if either a funding plan or certification is used.

## **9. Special Requirements for The Use of Sealed Sources in Industrial Radiography.**

- A. In addition to the requirements set forth in C.8, a specific license for use of sealed sources in industrial radiography will be issued if:
  - (1) the applicant will have an adequate program for training radiographers and radiographer trainees and submits to the Agency a schedule or description of such program which specifies the:
    - (a) initial training,
    - (b) periodic training,
    - (c) on-the-job training,
    - (d) means to be used by the licensee to determine the radiographer's knowledge and understanding of and ability to comply with Agency regulations and licensing requirements, and the operating and emergency procedures of the applicant, and
    - (e) means to be used by the licensee to determine the radiographer trainees knowledge and understanding of and ability to comply with the operating and emergency procedures of the applicant;

- (2) the applicant has established and submits to the Agency satisfactory written operating and emergency procedures described in E.14 of these regulations;
- (3) the applicant will have an internal inspection system adequate to assure that these regulations, license provisions, and the applicant's operating and emergency procedures are followed by radiographers and radiographer trainees; the inspection system shall include the performance of internal inspections at intervals not to exceed 3 months and the retention of records of such inspections for 2 years;
- (4) the applicant submits to the Agency a description of his overall organizational structure pertaining to the industrial radiography program, including specified delegations of authority and responsibility for operation of the program;
- (5) the applicant who desires to conduct his own leak tests has established adequate procedures to be followed in leak testing sealed sources for possible leakage and contamination and submits to the Agency a description of such procedures including:
  - (a) instrumentation to be used,
  - (b) method of performing tests, e.g., points on equipment to be smeared and method of taking smear, and
  - (c) pertinent experience of the person who will perform the test; and
- (6) the licensee shall conduct a program for inspection and maintenance of radiographic exposure devices and storage containers to assure proper functioning of components important to safety.

**10. Special Requirements for Specific Licenses of Broad Scope.** This section prescribes requirements for the issuance of specific licenses of broad scope for radioactive material and certain regulations governing holders of such licenses.<sup>7/</sup>

A. The different types of broad licenses are set forth below:

- (1) A "Type A specific license of broad scope" is a specific license authorizing receipt, acquisition, ownership, possession, use and transfer of any chemical or physical form of the radioactive material specified in the license, but not exceeding quantities specified in the license, for any authorized purpose. The quantities specified are usually in the multicurie range.
- (2) A "Type B specific license of broad scope" is a specific license authorizing receipt, acquisition, ownership, possession, use and transfer of any chemical or physical form of radioactive material specified in Schedule D, for any authorized purpose. The possession limit for a Type B broad license, if only one radionuclide is possessed thereunder, is the quantity specified for the radionuclide in Schedule D, Column I. If two or more radionuclides are possessed thereunder, the possession limit for each is determined as follows: For each radionuclide, determine the ratio of the quantity possessed to the applicable quantity specified in Schedule D, Column I, for that radionuclide. The sum of the ratios for all radionuclides possessed under the license shall not exceed unity.

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<sup>7/</sup> Authority to transfer possession or control by the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing byproduct material whose subsequent possession, use transfer, and disposal by all other persons are exempted from regulatory requirements may be obtained only from the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

- (3) A "Type C specific license of broad scope" is a specific license authorizing receipt, acquisition, ownership, possession, use and transfer of any chemical or physical form of radioactive material specified in Schedule D, for any authorized purpose. The possession limit for a Type C broad license, if only one radionuclide is possessed thereunder, is the quantity specified for that radionuclide in Schedule D, Column II. If two or more radionuclides are possessed thereunder, the possession limit is determined for each as follows: For each radionuclide determine the ratio of the quantity possessed to the applicable quantity specified in Schedule D, Column II, for that radionuclide. The sum of the ratios for all radionuclides possessed under the license shall not exceed unity.

B. An application for a Type A specific license of broad scope will be approved if:

- (1) the applicant satisfies the general requirements specified in C.8.;
- (2) the applicant has engaged in a reasonable number of activities involving the use of radioactive material; and
- (3) the applicant has established administrative controls and provisions relating to organization and management, procedures, record keeping, material control and accounting, and management review that are necessary to assure safe operations, including:
  - (a) the establishment of a radiation safety committee composed of such persons as a radiation safety officer, a representative of management, and persons trained and experienced in the safe use of radioactive material;
  - (b) the appointment of a radiation safety officer who is qualified by training and experience in radiation protection, and who is available for advice and assistance on radiation safety matters; and
  - (c) the establishment of appropriate administrative procedures to assure:
    - (i) control of procurement and use of radioactive material;
    - (ii) completion of safety evaluations of proposed uses of radioactive material which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user, and the operating or handling procedures; and
    - (iii) review, approval, and recording by the radiation safety committee of safety evaluations of proposed uses prepared in accordance with C.10.B.(3). prior to use of the radioactive material.

C. An application for a Type B specific license of broad scope will be approved if:

- (1) the applicant satisfies the general requirements specified in C.8.; and
- (2) the applicant has established administrative controls and provisions relating to organization and management, procedures, record keeping, material control and accounting, and management review that are necessary to assure safe operations, including:
  - (a) the appointment of a radiation safety officer who is qualified by training and experience in radiation protection, and who is available for advice and assistance on radiation safety matters, and
  - (b) the establishment of appropriate administrative procedures to assure:
    - (i) control of procurement and use of radioactive material,

- (ii) completion of safety evaluations of proposed uses of radioactive material which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user, and the operating or handling procedures, and
- (iii) review, approval and recording by the radiation safety officer of safety evaluations of proposed uses prepared in accordance with C.10.C.(2). prior to use of the radioactive material.

D. An application for a Type C specific license of broad scope will be approved if:

- (1) the applicant satisfies the general requirements specified in C.8;
- (2) the applicant submits a statement that radioactive material will be used only by, or under the direct supervision of, individuals who have received:
  - (a) a college degree at the bachelor level, or equivalent training and experience, in the physical or biological sciences or in engineering, and
  - (b) at least 40 hours of training and experience in the safe handling of radioactive material, and in the characteristics of ionizing radiation, units of radiation dose and quantities, radiation detection instrumentation, and biological hazards of exposure to radiation appropriate to the type and forms of radioactive material to be used; and
- (3) the applicant has established administrative controls and provisions relating to procurement of radioactive material, procedures, record keeping, material control and accounting, and management review necessary to assure safe operations.

E. Specific licenses of broad scope are subject to the following conditions:

- (1) Unless specifically authorized, persons licensed pursuant to C.10 shall not:
  - (a) conduct tracer studies in the environment involving direct release of radioactive material;
  - (b) receive, acquire, own, possess, use or transfer devices containing 100,000 curies or more of radioactive material in sealed sources used for irradiation of materials;
  - (c) conduct activities for which a specific license issued by the Agency under C.9., or, C.11. or Part G is required; or
  - (d) add or cause the addition of radioactive material to any food, beverage, cosmetic, drug, or other product designed for ingestion or inhalation by, or application to, a human being.
- (2) Each Type A specific license of broad scope issued under this part shall be subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of, individuals approved by the licensee's radiation safety committee.
- (3) Each Type B specific license of broad scope issued under this part shall be subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of, individuals approved by the licensee's radiation safety officer.
- (4) Each Type C specific license of broad scope issued under this part shall be subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of, individuals who satisfy the requirements of C.10.D.

**11. Special Requirements for a Specific License to Manufacture, Assemble, Repair or Distribute Commodities, Products or Devices which Contain Radioactive Material.****A. Licensing the Introduction of Radioactive Material into Products in Exempt Concentrations.**

- (1) In addition to the requirements set forth in C.8., a specific license authorizing the introduction of radioactive material into a product or material owned by or in the possession of the licensee or another to be transferred to persons exempt under C.3.A.(1). will be issued if:
  - (a) the applicant submits a description of the product or material into which the radioactive material will be introduced, intended use of the radioactive material and the product or material into which it is introduced, method of introduction, initial concentration of the radioactive material in the product or material, control methods to assure that no more than the specified concentrations is introduced into the product or material, estimated time interval between introduction and transfer of the product or material, and estimated concentration of the radioactive material in the product or material at the time of transfer; and
  - (b) the applicant provides reasonable assurance that the concentrations of radioactive material at the time of transfer will not exceed the concentrations in Schedule A, the reconcentration of the radioactive material in concentrations exceeding those in Schedule A is not likely, that use of lower concentrations is not feasible, and that the product or material is not likely to be incorporated in any food, beverage, cosmetic, drug or other commodity or product designed for ingestion or inhalation by, or application to, a human being.
- (2) Each person licensed under C.11.A. shall file an annual report with the Agency which shall identify the type and quantity of each product or material into which radioactive material has been introduced during the reporting period; name and address of the person who owned or possessed the product or material, into which radioactive material has been introduced, at the time of introduction; the type and quantity of radionuclide introduced into each such product or material; and the initial concentrations of the radionuclide in the product or material at time of transfer of the radioactive material by the licensee. If no transfers of radioactive material have been made pursuant to C.11.A. during the reporting period, the report shall so indicate. The report shall cover the year ending June 30, and shall be filed within 30 days thereafter.

**B. Licensing the Distribution of Radioactive Material in Exempt Quantities.<sup>8/</sup>**

- (1) An application for a specific license to distribute NARM to persons exempted from these regulations pursuant to C.3.B. will be approved if:
  - (a) the radioactive material is not contained in any food, beverage, cosmetic, drug, or other commodity designed for ingestion or inhalation by, or application to, a human being;
  - (b) the radioactive material is in the form of processed chemical elements, compounds, or mixtures, tissue samples, bioassay samples, counting standards, plated or encapsulated sources, or similar substances, identified as radioactive and to be used for its radioactive properties, but is not incorporated into any manufactured or assembled commodity, product, or device intended for commercial distribution; and

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<sup>8/</sup> Authority to transfer possession or control by the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing byproduct material whose subsequent possession, use transfer, and disposal by all other persons are exempted from regulatory requirements may be obtained only from the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

- (c) the applicant submits copies of prototype labels and brochures and the Agency approves such labels and brochures.
- (2) The license issued under C.11.B.(1). is subject to the following conditions:
- (a) No more than 10 exempt quantities; shall be sold or transferred in any single transaction. However, an exempt quantity may be composed of fractional parts of one or more of the exempt quantity provided the sum of the fractions shall not exceed unity.
  - (b) Each exempt quantity shall be separately and individually packaged. No more than 10 such packaged exempt quantities shall be contained in any outer package for transfer to persons exempt pursuant to C.4.A. The outer package shall be such that the dose rate at the external surface of the package does not exceed 0.5 millirem per hour.
  - (c) The immediate container of each quantity or separately packaged fractional quantity of radioactive material shall bear a durable, legible label which:
    - (i) identifies the radionuclide and the quantity of radioactivity; and
    - (ii) bears the words "Radioactive Material".
  - (d) In addition to the labeling information required by C.11.B(2)(c), the label affixed to the immediate container, or an accompanying brochure, shall:
    - (i) state that the contents are exempt from Licensing State requirements;
    - (ii) bear the words "Radioactive Material--Not for Human Use--Introduction into Foods, Beverages, Cosmetics, Drugs, or Medicinals, or into Products Manufactured for Commercial Distribution is Prohibited--Exempt Quantities Should Not Be Combined", and
    - (iii) set forth appropriate additional radiation safety precautions and instructions relating to the handling, use, storage, and disposal of the radioactive material.
- (3) Each person licensed under C.11.B. shall maintain records identifying, by name and address, each person to whom radioactive material is transferred for use under C.3.B. or the equivalent regulations of a Licensing State, and stating the kinds and quantities of radioactive material transferred. An annual summary report stating the total quantity of each radionuclide transferred under the specific license shall be filed with the Agency. Each report shall cover the year ending June 30, and shall be filed within 30 days thereafter. If no transfers of radioactive material have been made pursuant to C.11.B. during the reporting period, the report shall so indicate.
- C. Licensing the Incorporation of Naturally Occurring and Accelerator-Produced Radioactive Material into Gas and Aerosol Detectors. An application for a specific license authorizing the incorporation of NARM into gas and aerosol detectors to be distributed to persons exempt under C.3.C.3. will be approved if the application satisfies requirements equivalent to those contained in Section 32.26 of 10 CFR Part 32. The maximum quantity of Radium-226 in each device shall not exceed 0.1 microcurie (3.7 kBq). NARM radionuclides are found in Appendix B to Part C.
- D. Licensing the Manufacture and Distribution of Devices to Persons Generally Licensed Under C.6.D.
- (1) An application for a specific license to manufacture or distribute devices containing radioactive material, excluding special nuclear material, to persons generally licensed under C.6.D or equivalent regulations of the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State will be approved if:
    - (a) the applicant satisfies the general requirements of C.8.;

**C.11.D.(1)(b)**

(b) the applicant submits sufficient information relating to the design, manufacture, prototype testing, quality control, labels, proposed uses, installation, servicing, leak testing, operating and safety instructions, and potential hazards of the device to provide reasonable assurance that:

- (i) the device can be safely operated by persons not having training in radiological protection,
- (ii) under ordinary conditions of handling, storage, and use of the device, the radioactive material contained in the device will not be released or inadvertently removed from the device, and it is unlikely that any person will receive in one year a dose in excess of 10 percent of the limits specified in D.6., and
- (iii) under accident conditions (such as fire and explosion) associated with handling, storage, and use of the device, it is unlikely that any person would receive an external radiation dose or dose commitment in excess of the following organ doses

Organ	Dose
Whole body; head and trunk; active blood-forming organs; gonads; or lens of eye	15 rems (150 mSv)
Hands and forearms; feet and ankles; localized areas of skin averaged over areas no larger than 1 square centimeter	200 rems (2 Sv)
Other organs	50 rems (500 mSv)

(c) each device bears a durable, legible, clearly visible label or labels approved by the Agency, which contain in a clearly identified and separate statement:

- (i) instructions and precautions necessary to assure safe installation, operation, and servicing of the device (documents such as operating and service manuals may be identified in the label and used to provide this information),
- (ii) the requirement, or lack of requirement, for leak testing, or for testing any on-off mechanism and indicator, including the maximum time interval for such testing, and the identification of radioactive material by isotope, quantity of radioactivity, and date of determination of the quantity, and
- (iii) the information called for in one of the following statements, as appropriate, in the same or substantially similar form:

- (a) The receipt, possession, use, and transfer of this device, Model\_\_\_\_\_/, Serial No.\_\_\_\_\_/ are subject to a general license or the equivalent and the regulations of the U.S. Nuclear Regulatory Commission or a State with which the U.S. Nuclear Regulatory Commission has entered into an agreement for the exercise of regulatory authority. This label shall be maintained on the device in a legible condition. Removal of this label is prohibited.

**CAUTION - RADIOACTIVE MATERIAL**

(Name of manufacturer or distributor)

- (b) The receipt, possession, use, and transfer of this device, Model\_\_\_\_\_/, Serial No.\_\_\_\_\_,/ are subject to a general license or the equivalent, and the regulations of a Licensing State. This label shall be maintained on the device in a legible condition. Removal of this label is prohibited.

**CAUTION - RADIOACTIVE MATERIAL**

(Name of manufacturer or distributor)

- (2) In the event the applicant desires that the device be required to be tested at intervals longer than six months, either for proper operation of the on-off mechanism and indicator, if any, or for leakage of radioactive material or for both, he shall include in his application sufficient information to demonstrate that such longer interval is justified by performance characteristics of the device or similar devices and by design features which have a significant bearing on the probability or consequences of leakage of radioactive material from the device or failure of the on-off mechanism and indicator. In determining the acceptable interval for the test for leakage of radioactive material, the Agency will consider information, which includes, but is not limited to:

- (a) primary containment (source capsule);
- (b) protection of primary containment;
- (c) method of sealing containment;
- (d) containment construction materials;
- (e) form of contained radioactive material;
- (f) maximum temperature withstood during prototype tests;
- (g) maximum pressure withstood during prototype tests;
- (h) maximum quantity of contained radioactive material;

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<sup>9/</sup> The model, serial number, and name of the manufacturer or distributor may be omitted from this label provided the information is elsewhere specified in labeling affixed to the device.

- (i) radiotoxicity of contained radioactive material; and
  - (j) operating experience with identical devices or similarly designed and constructed devices.
- (3) In the event the applicant desires that the general licensee under C.6.D, or under equivalent regulations of the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State be authorized to install the device, collect the sample to be analyzed by a specific licensee for leakage of radioactive material, service the device, test the on-off mechanism and indicator, or remove the device from installation, he shall include in his application written instructions to be followed by the general licensee, estimated calendar quarter doses associated with such activity or activities, and bases for such estimates. The submitted information shall demonstrate that performance of such activity or activities by an individual untrained in radiological protection, in addition to other handling, storage, and use of devices under the general license, is unlikely to cause that individual to receive in one year a dose in excess of 10 percent of the limits specified in D.6.
- (4) Each person licensed under C.11.D. to distribute devices to generally licensed persons shall:
- (a) Furnish a copy of the general license contained in C.6.D to each person to whom he directly or through an intermediate person transfers radioactive material in a device for use pursuant to the general license contained in C.6.D.
  - (b) Furnish a copy of the general license contained in the U.S. Nuclear Regulatory Commission's, Agreement State's or Licensing State's regulation equivalent to C.6.D, or alternatively, furnish a copy of the general license contained in C.6.D to each person to whom he directly or through an intermediate person transfers radioactive material in a device for use pursuant to the general license of the U.S. Nuclear Regulatory Commission, the Agreement State or the Licensing State. If a copy of the general license in C.6.D is furnished to such a person, it shall be accompanied by a note explaining that the use of the device is regulated by the U.S. Nuclear Regulatory Commission, Agreement State or Licensing State under requirements substantially the same as those in C.6.D.
  - (c) Report to the Agency all transfers of such devices to persons for use under the general license in C.6.D. Such report shall identify each general licensee by name and address, an individual by name and/or position who may constitute a point of contact between the Agency and the general licensee, the type and model number of device transferred, and the quantity and type of radioactive material contained in the device. If one or more intermediate persons will temporarily possess the device at the intended place of use prior to its possession by the user, the report shall include identification of each intermediate person by name, address, contact, and relationship to the intended user. If no transfers have been made to persons generally licensed under C.6.D. during the reporting period, the report shall so indicate. The report shall cover each calendar quarter and shall be filed within 30 days thereafter.
  - (d) Reports to Other Agencies.
    - (i) Report to the U.S. Nuclear Regulatory Commission all transfers of such devices to persons for use under the U.S. Nuclear Regulatory Commission general license in Section 31.5 of 10 CFR Part 31.
    - (ii) Report to the responsible State Agency all transfers of devices manufactured and distributed pursuant to C.11.D for use under general license in that State's regulations equivalent to C.6.D..

- (iii) Such reports shall identify each general licensee by name and address, an individual by name and/or position who may constitute a point of contact between the agency and the general licensee, the type and model of the device transferred, and the quantity and type of radioactive material contained in the device. If one or more intermediate persons will temporarily possess the device at the intended place of use prior to its possession by the user, the report shall include identification of each intermediate person by name, address, contact, and relationship to the intended user. The report shall be submitted within 30 days after the end of each calendar quarter in which such a device is transferred to the generally licensed person.
- (iv) If no transfers have been made to U.S. Nuclear Regulatory Commission licensees during the reporting period, this information shall be reported to the U.S. Nuclear Regulatory Commission.
- (v) If no transfers have been made to general licensees within a particular State during the reporting period, this information shall be reported to the responsible State Agency upon request of the agency.
- (e) Keep records showing the name, address, and the point of contact for each general licensee to whom he directly or through an intermediate person transfers radioactive material in devices for use pursuant to the general license provided in C.6.D., or equivalent regulations of the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State. The records shall show the date of each transfer, the radionuclide and the quantity of radioactivity in each device transferred, the identity of any intermediate person, and compliance with the report requirements of C.11.D.(4).

E. Special Requirements for the Manufacture, Assembly, or Repair of Luminous Safety Devices for Use in Aircraft. An application for a specific license to manufacture, assemble, or repair luminous safety devices containing tritium or promethium-147 for use in aircraft, for distribution to persons generally licensed under C.6.C will be approved subject to the following conditions:

- (1) The applicant satisfies the general requirements specified in C.8; and
- (2) the applicant satisfies the requirements of Sections 32.53, 32.54, 32.55, 32.56, 32.101, of 10 CFR Part 32 or their equivalent.

F. Special Requirements for License to Manufacture Calibration Sources Containing Americium-241, Plutonium or Radium-226 for Distribution to Persons Generally Licensed Under C.6.E. An application for a specific license to manufacture calibration and reference sources containing americium-241, plutonium or radium-226 to persons generally licensed under C.6.E will be approved subject to the following conditions:

- (1) The applicant satisfies the general requirement of C.8; and
- (2) the applicant satisfies the requirements of Sections 32.57, 32.58, 32.59, 32.102 of 10 CFR Part 32 and Section 70.39 of 10 CFR Part 70 or their equivalent.

G. Manufacture and Distribution of Radioactive Material for Certain In Vitro Clinical or Laboratory Testing Under General License. An application for a specific license to manufacture or distribute radioactive material for use under the general license of C.6.F will be approved if:

- (1) The applicant satisfies the general requirements specified in C.8.
- (2) The radioactive material is to be prepared for distribution in prepackaged units of:
  - (a) Iodine-125 in units not exceeding 10 microcuries each.

- (b) Iodine-131 in units not exceeding 10 microcuries each.
  - (c) Carbon-14 in units not exceeding 10 microcuries each.
  - (d) Hydrogen-3 (tritium) in units not exceeding 50 microcuries each.
  - (e) Iron-59 in units not exceeding 20 microcuries each.
  - (f) Cobalt-57 in units not exceeding 10 microcuries each.
  - (g) Selenium-75 in units not exceeding 10 microcuries each.
  - (h) Mock Iodine-125 in units not exceeding 0.05 microcurie of iodine-129 and 0.005 microcurie of americium-241 each.
- (3) Each prepackaged unit bears a durable, clearly visible label:
- (a) Identifying the radioactive contents as to chemical form and radionuclide, and indicating that the amount of radioactivity does not exceed 10 microcuries of iodine-125, iodine-131, carbon-14, cobalt-57, or selenium-75; 50 microcuries of hydrogen-3 (tritium); 20 microcuries of iron-59; or Mock Iodine-125 in units not exceeding 0.05 microcurie of iodine-129 and 0.005 microcurie of americium-241 each; and
  - (b) displaying the radiation caution symbol described in D.27. and the words, "CAUTION, RADIOACTIVE MATERIAL", and "Not for Internal or External Use in Humans or Animals".
- (4) One of the following statements, as appropriate, or a substantially similar statement which contains the information called for in one of the following statements, appears on a label affixed to each prepackaged unit or appears in a leaflet or brochure which accompanies the package:
- (a) **This radioactive material may be received, acquired, possessed, and used only by physicians, veterinarians, clinical laboratories or hospitals and only for in vitro clinical or laboratory tests not involving internal or external administration of the material, or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use, and transfer are subject to the regulations and general license of the U.S. Nuclear Regulatory Commission or of a State with which the Commission has entered into an agreement for the exercise of regulatory authority.**  
(Name of manufacturer)
  - (b) **This radioactive material may be received, acquired, possessed, and used only by physicians, veterinarians, clinical laboratories or hospitals and only for in vitro clinical or laboratory tests not involving internal or external administration of the material, or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use, and transfer are subject to the regulations and a general license of a Licensing State.**  
(Name of manufacturer)
- (5) The label affixed to the unit, or the leaflet or brochure which accompanies the package, contains adequate information as to the precautions to be observed in handling and storing such radioactive material. In the case of the Mock Iodine-125 reference or calibration source, the information accompanying the source must also contain directions to the licensee regarding the waste disposal requirements set out in D.33. of these regulations.

H. Licensing the Manufacture and Distribution of Ice Detection Devices. An application for a specific license to manufacture and distribute ice detection devices to persons generally licensed under C.6.G will be approved subject to the following conditions:

- (1) the applicant satisfies the general requirements of C.8, and
- (2) the criteria of Sections 32.61, 32.62, 32.103 of 10 CFR Part 32 are met.

I. Manufacture and Distribution of Radiopharmaceuticals Containing Radioactive Material for Medical Use Under Part G Licenses. An application for a specific license to manufacture and distribute radiopharmaceuticals containing radioactive material for use by persons licensed pursuant to Part G for the uses listed in Part G.100, 200 and 300 will be approved if:

- (1) The applicant satisfies the general requirements specified in C.8. of this part;
- (2) The applicant submits evidence that:
  - (a) the radiopharmaceutical containing radioactive material will be manufactured, labeled, and packaged in accordance with the Federal Food, Drug and Cosmetic Act or the Public Health Service Act, such as a new drug application (NDA) approved by the Food and Drug Administration (FDA), or a "Notice of Claimed Investigational Exemption for a New Drug" (IND) that has been accepted by the FDA, or
  - (b) the manufacture and distribution of the radiopharmaceutical containing radioactive material is not subject to the Federal Food, Drug and Cosmetic Act and the Public Health Service Act;
- (3) The applicant submits information on the radionuclide, chemical and physical form, packaging including maximum activity per package, and shielding provided by the packaging of the radioactive material which is appropriate for safe handling and storage of radiopharmaceuticals by group licensees; and
- (4)
  - (a) The label affixed to each package of the radiopharmaceutical contains information on the radionuclide, quantity, and date of assay and the label affixed to each package, or the leaflet or brochure which accompanies each package, contains a statement that the radiopharmaceutical is licensed by the Agency for distribution to persons licensed pursuant to Part G as appropriate, for the uses in G.100, 200 and 300 or under equivalent licenses of the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State.
  - (b) The labels, leaflets or brochures required by C.11.I.(4) are in addition to the labeling required by the Food and Drug Administration (FDA) and they may be separate from or, with the approval of FDA, may be combined with the labeling required by FDA.

J. Manufacture and Distribution of Generators or Reagent Kits for Preparation of Radiopharmaceuticals Containing Radioactive Material. An application for a specific license to manufacture and distribute generators or reagent kits containing radioactive material for preparation of radiopharmaceuticals by persons licensed pursuant to Part G.200 will be approved if:

- (1) the applicant satisfies the general requirements specified in C.8.;
- (2) the applicant submits evidence that:
  - (a) the generator or reagent kit is to be manufactured, labeled and packaged in accordance with the Federal Food, Drug and Cosmetic Act or the Public Health Service Act, such as a new drug application (NDA) approved by the Food and Drug Administration (FDA), or a "Notice of Claimed Investigational Exemption for a New Drug" (IND) that has been accepted by the FDA, or

- (b) the manufacture and distribution of the generator or reagent kit are not subject to the Federal Food, Drug and Cosmetic Act and the Public Health Service Act;
- (3) the applicant submits information on the radionuclide, chemical and physical form, packaging including maximum activity per package, and shielding provided by the packaging of the radioactive material contained in the generator or reagent kit;
- (4) the label affixed to the generator or reagent kit contains information on the radionuclide, quantity, and date of assay; and
- (5) the label affixed to the generator or reagent kit, or the leaflet or brochure which accompanies the generator or reagent kit, contains:
  - (a) adequate information, from a radiation safety standpoint, on the procedures to be followed and the equipment and shielding to be used in eluting the generator or processing radioactive material with the reagent kit, and
  - (b) a statement that this generator or reagent kit (as appropriate) is approved for use by persons licensed by the Agency pursuant to Part G.200 or under equivalent licenses of the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State. The labels, leaflets or brochures required by C.11.J are in addition to the labeling required by FDA and they may be separate from or, with the approval of FDA, may be combined with the labeling required by FDA.

**NOTE:** Although the Agency does not regulate the manufacture and distribution of reagent kits that do not contain radioactive material, it does regulate the use of such reagent kits for the preparation of radiopharmaceuticals containing radioactive material as part of its licensing and regulation of the users of radioactive material. Any manufacturer of reagent kits that do not contain radioactive material who desires to have his reagent kits approved by the Agency for use by persons licensed pursuant to Part G.200 may submit the pertinent information specified in C.11.J.

K. **Manufacture and Distribution of Sources or Devices Containing Radioactive Material for Medical Use.** An application for a specific license to manufacture and distribute sources and devices containing radioactive material to persons licensed pursuant to Part G for use as a calibration or reference source or for the uses listed in Part G.400. and G.500 will be approved if:

- (1) The applicant satisfies the general requirements in C.8 of this part.
- (2) The applicant submits sufficient information regarding each type of source or device pertinent to an evaluation of its radiation safety, including:
  - (a) the radioactive material contained, its chemical and physical form, and amount,
  - (b) details of design and construction of the source or device,
  - (c) procedures for, and results of, prototype tests to demonstrate that the source or device will maintain its integrity under stresses likely to be encountered in normal use and accidents,
  - (d) for devices containing radioactive material, the radiation profile of a prototype device,
  - (e) details of quality control procedures to assure that production sources and devices meet the standards of the design and prototype tests,
  - (f) procedures and standards for calibrating sources and devices,

- (g) legend and methods for labeling sources and devices as to their radioactive content, and
  - (h) instructions for handling and storing the source or device from the radiation safety standpoint; these instructions are to be included on a durable label attached to the source or device or attached to a permanent storage container for the source or device; provided, the instructions which are too lengthy for such label may be summarized on the label and printed in detail on a brochure which is referenced on the label.
- (3) The label affixed to the source or device, or to the permanent storage container for the source or device, contains information on the radionuclide, quantity, and date of assay, and a statement that the name of source or device is licensed by the Agency for distribution to persons licensed pursuant to Part G sections G.400. and G.500. or under equivalent licenses of the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State, provided, that such labeling for sources which do not require long term storage (e.g., gold-198 seeds) may be on a leaflet or brochure which accompanies the source.
- (4) In the event the applicant desires that the source or device be required to be tested for leakage of radioactive material at intervals longer than six months, he shall include in his application sufficient information to demonstrate that such longer interval is justified by performance characteristics of the source or device or similar sources or devices and by design features that have a significant bearing on the probability or consequences of leakage of radioactive material from the source.
- (5) In determining the acceptable interval for test of leakage of radioactive material, the Agency will consider information that includes, but is not limited to:
- (a) primary containment (source capsule),
  - (b) protection of primary containment,
  - (c) method of sealing containment,
  - (d) containment construction materials,
  - (e) form of contained radioactive material,
  - (f) maximum temperature withstood during prototype tests,
  - (g) maximum pressure withstood during prototype tests,
  - (h) maximum quantity of contained radioactive material,
  - (i) radiotoxicity of contained radioactive material, and
  - (j) operating experience with identical sources or devices or similarly designed and constructed sources or devices.
- L. Requirements for License to Manufacture and Distribute Industrial Products Containing Depleted Uranium for Mass-Volume Applications.
- (1) An application for specific license to manufacture industrial products and devices containing depleted uranium for use pursuant to C.5.D or equivalent regulations of the U.S. Nuclear Regulatory Commission or an Agreement State will be approved if:
- (a) the applicant satisfies the general requirements specified in C.8;

- (b) the applicant submits sufficient information relating to the design, manufacture, prototype testing, quality control procedures, labeling or marking, proposed uses, and potential hazards of the industrial product or device to provide reasonable assurance that possession, use, or transfer of the depleted uranium in the product or device is not likely to cause any individual to receive in one year a radiation dose in excess of 10 percent of the limits specified in D.6.; and
  - (c) the applicant submits sufficient information regarding the industrial product or device and the presence of depleted uranium for a mass-volume application in the product or device to provide reasonable assurance that unique benefits will accrue to the public because of the usefulness of the product or device.
- (2) In the case of an industrial product or device whose unique benefits are questionable, the Agency will approve an application for a specific license under C.11.L only if the product or device is found to combine a high degree of utility and low probability of uncontrolled disposal and dispersal of significant quantities of depleted uranium into the environment.
- (3) The Agency may deny any application for a specific license under C.11.L if the end use(s) of the industrial product or device cannot be reasonably foreseen.
- (4) Each person licensed pursuant to C.11.L shall:
- (a) maintain the level of quality control required by the license in the manufacture of the industrial product or device, and in the installation of the depleted uranium into the product or device;
  - (b) label or mark each unit to:
    - (i) identify the manufacturer of the product or device and the number of the license under which the product or device was manufactured, the fact that the product or device contains depleted uranium, and the quantity of depleted uranium in each product or device; and
    - (ii) state that the receipt, possession, use, and transfer of the product or device are subject to a general license or the equivalent and the regulations of the U.S. Nuclear Regulatory Commission or of an Agreement State;
  - (c) assure that the depleted uranium before being installed in each product or device has been impressed with the following legend clearly legible through any plating or other covering: "Depleted Uranium";
  - (d) (i) furnish a copy of the general license contained in C.5.D and a copy of HHE Form 860 to each person to whom he transfers depleted uranium in a product or device for use pursuant to the general license contained in C.5.D, or
    - (ii) furnish a copy of the general license contained in the U.S. Nuclear Regulatory Commission's or Agreement State's regulation equivalent to C.5.D and a copy of the U.S. Nuclear Regulatory Commission's or Agreement State's certificate, or alternatively, furnish a copy of the general license contained in C.5.D and a copy of HHE Form 860 to each person to whom he transfers depleted uranium in a product or device for use pursuant to the general license of the U.S. Nuclear Regulatory Commission or an Agreement State, with a note explaining that use of the product or device is regulated by the U.S. Nuclear Regulatory Commission or an Agreement State under requirements substantially the same as those in C.5.D;

- (e) report to the Agency all transfers of industrial products or devices to persons for use under general license in C.5.D. Such report shall identify each general licensee by name and address, an individual by name and/or position who may constitute a point of contact between the Agency and the general licensee, the type and model number of device transferred, and the quantity of depleted uranium contained in the product or device. The report shall be submitted within 30 days after the end of each calendar quarter in which such a product or device is transferred to the generally licensed person. If no transfers have been made to persons generally licensed under C.5.D during the reporting period, the report shall so indicate;
- (f)
  - (i) report to the U.S. Nuclear Regulatory Commission all transfers of industrial products or devices to persons for use under the U.S. Nuclear Regulatory Commission general license in Section 40.25 of 10 CFR Part 40,
  - (ii) report to the responsible State Agency all transfers of devices manufactured and distributed pursuant to C.11.L for use under a general license in that State's regulations equivalent to C.5.D,
  - (iii) such report shall identify each general licensee by name and address, an individual by name and/or position who may constitute a point of contact between the agency and the general licensee, the type and model number of the device transferred, and the quantity of depleted uranium contained in the product or device. The report shall be submitted within 30 days after the end of each calendar quarter in which such product or device is transferred to the generally licensed person,
  - (iv) if no transfers have been made to U.S. Nuclear Regulatory Commission licensees during the reporting period, this information shall be reported to the U.S. Nuclear Regulatory Commission,
  - (v) if no transfers have been made to general licensees within a particular Agreement State during the reporting period, this information shall be reported to the responsible Agreement State Agency; and
- (g) keep records showing the name, address, and point of contact for each general licensee to whom he transfers depleted uranium in industrial products or devices for use pursuant to the general license provided in C.5.D or equivalent regulations of the U.S. Nuclear Regulatory Commission or an Agreement State. The records shall be maintained for a period of two years and shall show the date of each transfer, the quantity of depleted uranium in each product or device transferred, and compliance with the report requirements of this section.

## **12. Special Requirements for Issuance of Specific Licenses for Source Material Milling.** *Reserved.*

## **13. Issuance of Specific Licenses.**

- A. Upon a determination that an application meets the requirements of the Act and the regulations of the Agency, the Agency will issue a specific license authorizing the proposed activity in such form and containing such conditions and limitations as it deems appropriate or necessary.
- B. The Agency may incorporate in any license at the time of issuance, or thereafter by appropriate rule, regulation, or order, such additional requirements and conditions with respect to the licensee's receipt, possession, use and transfer of radioactive material subject to this part as it deems appropriate or necessary in order to:

- (1) minimize danger to public health and safety or property;
- (2) require such reports and the keeping of such records, and to provide for such inspections of activities under the license as may be appropriate or necessary; and
- (3) prevent loss or theft of material subject to this part.

**14. Specific Terms and Conditions of License.**

- A. Each license issued pursuant to this part shall be subject to all provisions of the Act, now or hereafter in effect, and to all rules, regulations, and orders of the Agency.
- B. No license issued or granted under this part and no right to possess or utilize radioactive material granted by any license issued pursuant to this part shall be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of any license to any person unless the Agency shall, after securing full information find that the transfer is in accordance with the provisions of the Act, now or hereafter in effect and to all valid rules, regulations and orders of the Agency and shall give its consent in writing.
- C. Each person licensed by the Agency pursuant to this part shall confine his use and possession of the material licensed to the locations and purposes authorized in the license.
- D. Each licensee shall notify the Agency, in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy under any Chapter of Title 11 (Bankruptcy) of the United States Code by or against:
  - (1) The licensee;
  - (2) An entity (as that term is defined in 11 U.S.C. 101(14)) controlling the licensee or listing the license or licensee as property of the estate; or
  - (3) An affiliate (as that term is defined in 11 U.S.C. 101(2)) of the licensee.
  - (4) This notification must indicate:
    - (a) The bankruptcy court in which the petition for bankruptcy was filed; and
    - (b) The date of the filing of the petition.

**15. Expiration and Termination of Licenses**

- A. Except as provided in C.16.B and paragraph .D(3) of this section, each specific license expires at the end of the day, in the month and year stated in the license.
- B. Each licensee shall notify the Agency immediately, in writing, and request termination of the license when the licensee decides to terminate all activities involving materials authorized under the license. The notification and request for termination of the license must include the reports and information specified in paragraphs .D(1)(d) and (e) of this section. The licensee is subject to the provisions of paragraphs (D) and (E) of this section, as applicable.
- C. No less than 30 days before the expiration date specified in a specific license the licensee shall either:
  - (1) Submit an application for license renewal under C.16; or

- (2) Notify the Agency in writing if the licensee decides not to renew the license.
- D. (1) If a licensee does not submit an application for license renewal under C.16, the licensee shall, on or before the expiration date specified in the license:
- (a) Terminate use of source, byproduct, or special nuclear material, as appropriate;
  - (b) Remove radioactive contamination to the extent practicable except for those procedures covered by paragraph C.15.D(3) of this section;
  - (c) Properly dispose of source material;
  - (d) Submit a completed form, Certificate of Disposition of Material; and
  - (e) Submit a radiation survey report of the premises to confirm the absence of radioactive materials or to establish the levels of residual radioactive contamination, unless the licensee demonstrates the absence of residual radioactive contamination in some other manner. The licensee shall, as appropriate:
    - (i) Report levels of radiation in units of microrads per hour of beta and gamma radiation at one centimeter and gamma radiation at one meter from surfaces and report levels of radioactivity in units of disintegrations per minute (or microcuries) per 100 square centimeters for removable and fixed surfaces, microcuries per milliliter for water, and picocuries per gram for contaminated solids such as soils, or concrete; and
    - (ii) Specify the survey instrument(s) used and certify that each instrument is properly calibrated and tested.
- (2) If no residual radioactive contamination attributable to activities conducted under the license is detected, the licensee shall submit a certification that no detectable radioactive contamination was found. If the information submitted under this paragraph and paragraphs .D(1)(d) and (e) of this section is adequate, the Agency will notify the licensee in writing that the license is terminated.
- (3) (a) If detectable levels of residual radioactive contamination attributable to activities conducted under a license are found, the license continues in effect beyond the expiration date, if necessary, with respect to possession of residual radioactive material present as contamination until the Agency notifies the licensee in writing that the license is terminated. During this time the licensee is subject to the provisions of paragraph (E) of this section.
- (b) In addition to the information submitted under paragraphs D.(1)(d) and (e) of this section the licensee shall submit a plan for decontamination, if required, as regards residual radioactive contamination remaining at the time the license expires.
- (c) The licensee shall also submit a plan for completion of decommissioning, recovery, or site reclamation if the procedures necessary to carry these out have not been previously approved by the Agency.
- E. The proposed decommissioning, recovery, or site reclamation plan, if required by paragraph C.15.D(3) or by license condition, must include:
- (1) Discussion of these planned activities;
  - (2) Description of methods used to assure protection of workers and the environment against radiation hazards during such activities;
  - (3) A description of the planned final radiation survey; and

- (4) An updated detailed cost estimate, comparison of that estimate with present funds set aside, and plans for assuring the availability of adequate funds for completion of decommissioning, recovery or site reclamation.
  - (5) The proposed plan will be approved by the Agency if the information therein demonstrates that the objectives of the plan will be completed as soon as is reasonable and that the health and safety of workers and the public will be adequately protected.
- F. Each licensee who possesses residual by-product material, source material, or special nuclear material under paragraph C.15.D(3), following the expiration date specified in the license, shall:
- (1) Limit actions involving source radioactive material to those related to decontamination and other activities related to preparation for release for unrestricted use; and
  - (2) Continue to control entry to restricted areas until they are suitable for release for unrestricted use and the Agency notifies the licensee in writing that the license is terminated.
- G. As the final step in decommissioning, the licensee shall-
- (1) Certify the disposition of all licensed material, including accumulated wastes, by submitting Maine Form 892 or equivalent information; and
  - (2) Conduct a radiation survey of the premises where the licensed activities were carried out and submit a report of the results of this survey, unless the licensee demonstrates in some other manner that the premises are suitable for release in accordance with the criteria for decommissioning in D.60 through D.65. The licensee shall, as appropriate-
    - (i) Report levels of gamma radiation in units of millirems per hour at one meter from surfaces, and report levels of radioactivity, including alpha and beta, in units of microcuries per 100 square centimeters - removable or fixed - for surfaces, microcuries per milliliter for water, and picocuries per gram for solids such as soils or concrete; and
    - (ii) Specify the survey instrument(s) used and certify that each instrument is properly calibrated and tested.
- H. Specific licenses, including expired licenses, will be terminated by written notice to the licensee when the Agency determines that:
- (1) Radioactive material has been properly disposed;
  - (2) Reasonable effort has been made to eliminate residual radioactive contamination, if present; and
  - (3) (i) A radiation survey has been performed which demonstrates that the premises are suitable for release in accordance with the criteria for decommissioning in D.60 through D.65; or  
(ii) Other information submitted by the licensee is sufficient to demonstrate that the premises are suitable for release in accordance with the criteria for decommissioning in D.60 through D.65.
  - (4) Records required by Part D have been received.

## **16. Renewal of Licenses.**

- A. Applications for renewal of specific licenses shall be filed in accordance with C.7.
- B. In any case in which a licensee, not less than 30 days prior to expiration of his existing license, has filed an application in proper form for renewal or for a new license authorizing the same activities, such existing license shall not expire until the application has been finally determined by the Agency.

**17. Amendment of Licenses at Request of Licensee.** Applications for amendment of a license shall be filed in accordance with C.7. and shall specify the respects in which the licensee desires his license to be amended and the grounds for such amendment .

**18. Agency Action on Application to Renew and Amend.** In considering an application by a licensee to renew or amend his license, the Agency will apply the criteria set forth in C.8, and C.9., C.10 or C.11 and Part E, Part G, and Part K of these regulations as applicable.

## **19. Persons Possessing a License for Source, Byproduct or Special Nuclear Material in Quantities Not Sufficient to Form a Critical Mass on Effective Date of These Regulations.**

Any person who, on the effective date of these regulations, possesses a general or specific license for source, byproduct, or special nuclear material in quantities not sufficient to form a critical mass, issued by the U.S. Nuclear Regulatory Commission, shall be deemed to possess a like license issued under this part and the Act, such license to expire either 90 days after receipt from the Agency of a notice of expiration of such license, or on the date of expiration specified in the U.S. Nuclear Regulatory Commission license, whichever is earlier.

**20. Persons Possessing Naturally Occurring and Accelerator-Produced Radioactive Material on Effective Date of These Regulations.** Any person who, on the effective date of these regulations, possesses NARM for which a specific license is required by the Act or this part shall be deemed to possess such a license issued under the Act and this part. Such license shall expire 90 days after the effective date of these regulations; provided, however, that if within the 90 days the person possessing such material files an application in proper form for a license, such existing license shall not expire until the application has been finally determined by the Agency. NARM radionuclides are shown in Appendix B to Part C .

## **21. Transfer of Material.**

- A. No licensee shall transfer radioactive material except as authorized pursuant to this section.
- B. Except as otherwise provided in the license and subject to the provisions of C.21.C and D, any licensee may transfer radioactive material:
  - (1) to the Agency with prior approval of the agency;
  - (2) to the U.S. Department of Energy;
  - (3) to any person exempt from these regulations to the extent permitted under such exemption;

(4) to any person authorized to receive such material under terms of a general license or its equivalent, or a specific license or equivalent licensing document, issued by the agency, the U.S. Nuclear Regulatory Commission, any Agreement State or any Licensing State, or to any person otherwise authorized to receive such material by the Federal Government or any agency thereof, the Agency, any Agreement State or any Licensing State; or

(5) as otherwise authorized by the Agency in writing.

C. Before transferring radioactive material to a specific licensee of the Agency, the U.S Nuclear Regulatory Commission, an Agreement State or a Licensing State, or to a general licensee who is required to register with the Agency, the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State prior to receipt of the radioactive material, the licensee transferring the material shall verify that the transferee's license authorizes the receipt of the type, form, and quantity of radioactive material to be transferred.

D. The following methods for the verification required by C.21.C are acceptable:

(1) The transferor may have in his possession, and read, a current copy of the transferee's specific license or registration certificate;

(2) the transferor may have in his possession a written certification by the transferee that he is authorized by license or registration certificate to receive the type, form, and quantity of radioactive material to be transferred, specifying the license or registration certificate number, issuing agency, and expiration date;

(3) for emergency shipments the transferor may accept oral certification by the transferee that he is authorized by license or registration certificate to receive the type, form, and quantity of radioactive material to be transferred, specifying the license or registration certificate number, issuing agency, and expiration date provided, that the oral certification is confirmed in writing within 10 days;

(4) the transferor may obtain other sources of information compiled by a reporting service from official records of the Agency, the U.S. Nuclear Regulatory Commission, the licensing agency or an Agreement State or a Licensing State as to the identity of licensees and the scope and expiration dates of licenses and registration; or

(5) when none of the methods of verification described in C.21.D 1-4 are readily available or when a transferor desires to verify that information received by one of such methods is correct or up-to-date, the transferor may obtain a record confirmation from the Agency, the U.S. Nuclear Regulatory Commission, or the licensing agency of an Agreement State or a Licensing State that the transferee is licensed to receive the radioactive material.

(6) Preparation for shipment and transport of radioactive material shall be in accordance with the provisions of Part L.

## **22. Modification, Revocation and Termination of Licenses.**

A. The terms and conditions of all licenses shall be subject to amendment, revision, or modification or the license may be suspended or revoked by reason of amendments to the Act, or by reason of rules, regulations and orders issued by the Agency.

B. Any license may be revoked, suspended or modified, in whole or in part, for any material false statement in the application or any statement of fact required under provisions of the Act, or because of conditions revealed by such application or statement of fact or any report, record, or inspection or other means which would warrant the Agency to refuse to grant a license on an original application, or for violation of, or failure to observe any of the terms and conditions of the Act, or of the license, or of any rule, regulation, or order of the Agency.

- C. Except in cases of willfulness or those in which the public health, interest or safety requires otherwise, no license shall be modified, suspended, or revoked unless, prior to the institution of proceedings therefor, facts of conduct which may warrant such action shall have been called to the attention of the licensee in writing and the licensee shall have been accorded an opportunity to demonstrate or achieve compliance with all lawful requirements.
- D. The Agency may terminate a specific license upon request submitted by the licensee to the Agency in writing.

## RECIPROCITY

### 23. Reciprocal Recognition of Licenses.

#### A. Licenses of Byproduct, Source, and Special Nuclear Material in Quantities Not Sufficient to Form a Critical Mass.

- (1) Subject to these regulations, any person who holds a specific license from the U.S. Nuclear Regulatory Commission or any Agreement State, and issued by the agency having jurisdiction where the licensee maintains an office for directing the licensed activity and at which radiation safety records are normally maintained, is hereby granted a general license to conduct the activities authorized in such licensing document within this State provided that:
  - (a) the licensing document does not limit the activity authorized by such document to specified installations or locations;
  - (b) the out-of-state licensee notifies the Agency in writing at least 3 working days prior to engaging in such activity and receive Agency approval. Such notification shall indicate the location, period, and type of proposed possession and use within the State, and shall be accompanied by a copy of the pertinent licensing document and HHE form 865. If, for a specific case, the 3 working day period would impose an undue hardship on the out-of-state licensee, he may, upon application to the Agency, obtain permission to proceed sooner. The Agency requires that the applicable Maine annual license fee accompany the initial request for reciprocity (see table 1 to appendix A of this part). This reciprocity fee will cover a period of one year from the time of application, at which time a new fee submittal will be required. This requirement does not waive the requirement for filing additional written notifications during the remainder of the calendar year following the receipt of the initial notification from a person engaging in activities under the general license provided in C.23.A(1).
  - (c) the out-of-state licensee complies with all applicable regulations of the Agency and with all the terms and conditions of his licensing document, except any such terms and conditions which may be inconsistent with applicable regulations of the Agency;
  - (d) the out-of-state licensee supplies such other information as the Agency may request; and
  - (e) the out-of-state licensee shall not transfer or dispose of radioactive material possessed or used under the general license provided in C.23.A(1) except by transfer to a person:
    - (i) specifically licensed by the Agency or by the U.S. Nuclear Regulatory Commission to receive such material, or
    - (ii) exempt from the requirements for a license for such material under C.3.
- (2) Notwithstanding the provisions of C.23.A(1), any person who holds a specific license issued by the U.S. Nuclear Regulatory Commission or an Agreement State authorizing the holder to manufacture, transfer, install, or service a device described in C.6.B(1) within areas subject to the jurisdiction of the licensing body is hereby granted a general license to install, transfer, demonstrate or service such a device in this State provided that:

- (a) the device has been manufactured, labeled, installed, and serviced in accordance with applicable provisions of the specific license issued to such person by the U.S. Nuclear Regulatory Commission or an Agreement State;
  - (b) such person shall assure that any labels required to be affixed to the device under regulations of the authority, which licensed manufacture of the device, bear a statement that "Removal of this label is prohibited";
  - (c) Such person shall file Agency Form HHE 867 "Registration Certificate – Service of Generally Licensed devices". The form shall be submitted within 30 days after the first entry or 30 days after the effective date of these regulations for persons in state prior to the effective date. The general licensee shall furnish such information as may be required by that form as well as the annual fee referenced in Appendix A of this Part. This registration fee will cover a period of one year from the time of application, at which time a new fee submittal will be required.
- (3) The Agency may withdraw, limit, or qualify its acceptance of any specific license or equivalent licensing document issued by another agency the U.S. Nuclear Regulatory Commission or an Agreement State, or any product distributed pursuant to such licensing document, upon determining that such action is necessary in order to prevent undue hazard to public health and safety or property.

**B. Licenses of Naturally Occurring and Accelerator-Produced Radioactive Material.**

- (1) Subject to these regulations, any person who holds a specific license from any Licensing State, and issued by the agency having jurisdiction where the licensee maintains an office for directing the licensed activity and at which radiation safety records are normally maintained, is hereby granted a general license to conduct the activities authorized in such licensing document within this State provided that:
- (a) the licensing document does not limit the activity authorized by such document to specified installations or locations;
  - (b) the out-of-state licensee notifies the Agency in writing at least 3 working days prior to engaging in such activity and receive Agency approval. Such notification shall indicate the location, period, and type of proposed possession and use within the State, and shall be accompanied by a copy of the pertinent licensing document and HHE form 865. If, for a specific case, the 3 working day period would impose an undue hardship on the out-of-state licensee, he may, upon application to the Agency, obtain permission to proceed sooner. The Agency requires that the applicable Maine annual license fee accompany the initial request for reciprocity (see table 1 to appendix A of this part). This reciprocity fee will cover a period of one year from the time of application, at which time a new fee submittal will be required. This requirement does not waive the requirement for filing additional written notifications during the remainder of the calendar year following the receipt of the initial notification from a person engaging in activities under the general license provided in C.23.B(1).
  - (c) the out-of-state licensee complies with all applicable regulations of the Agency and with all the terms and conditions of his licensing document, except any such terms and conditions which may be inconsistent with applicable regulations of the Agency;
  - (d) the out-of-state licensee supplies such other information as the Agency may request; and
  - (e) the out-of-state licensee shall not transfer or dispose of radioactive material possessed or used under the general license provided in C.23.B(1) except by transfer to a person:
    - (i) specifically licensed by the Agency or by another Licensing State to receive such material, or
    - (ii) exempt from the requirements for a license for such material under C.3.

- (2) Notwithstanding the provisions of C.23.B(1), any person who holds a specific license issued by a Licensing State authorizing the holder to manufacture, transfer, install, or service a device described in C.6.B(1) within areas subject to the jurisdiction of the licensing body is hereby granted a general license to install, transfer, demonstrate or service such a device in this State provided that:
- (a) The device has been manufactured, labeled, installed, and serviced in accordance with applicable provisions of the specific license issued to such person by a Licensing State;
  - (b) Such person shall assure that any labels required to be affixed to the device under regulations of the authority which licensed manufacture of the device bear a statement that "Removal of this label is prohibited"; and
  - (c) Such person shall file Agency Form HHE 867 "Registration Certificate – Service of Generally Licensed devices". The form shall be submitted within 30 days after the first entry or 30 days after the effective date of these regulations for persons in state prior to the effective date. The general licensee shall furnish such information as may be required by that form as well as the annual fee referenced in Appendix A of this Part. This registration fee will cover a period of one year from the time of application, at which time a new fee submittal will be required.
- C. The Agency may withdraw, limit or qualify its acceptance of any specific license or equivalent licensing document issued by another agency, or any product distributed pursuant to such licensing document, upon determining that such action is necessary in order to prevent undue hazard to public health and safety or property.

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## SCHEDULE A

### EXEMPT CONCENTRATIONS OF RADIOACTIVE MATERIALS WHICH ARE INTRODUCED INTO PRODUCTS (PART C.3.A)

Element (atomic number)	Isotope	Column I	Column II
		Gas Concentration $\mu\text{Ci/ml}^1/$	Liquid and Solid Concentration $\mu\text{Ci/ml}^2/$
Antimony (51)	Sb-122		$3 \times 10^{-4}$
	Sb-124		$2 \times 10^{-4}$
	Sb-125		$1 \times 10^{-3}$
Argon (18)	Ar-37	$1 \times 10^{-3}$	
	Ar-41	$4 \times 10^{-7}$	
Arsenic (33)	As-73		$5 \times 10^{-3}$
	As-74		$5 \times 10^{-4}$
	As-76		$2 \times 10^{-4}$
	As-77		$8 \times 10^{-4}$
Barium (56)	Ba-131		$2 \times 10^{-3}$
	Ba-140		$3 \times 10^{-4}$
Beryllium (4)	Be-7		$2 \times 10^{-2}$
Bismuth (83)	Bi-206		$4 \times 10^{-4}$
Bromine (35)	Br-82	$4 \times 10^{-7}$	$3 \times 10^{-3}$
Cadmium (48)	Cd-109		$2 \times 10^{-3}$
	Cd-115m		$3 \times 10^{-4}$
	Cd-115		$3 \times 10^{-4}$
Calcium (20)	Ca-45		$9 \times 10^{-5}$
	Ca-47		$5 \times 10^{-4}$
Carbon (6)	C-14	$1 \times 10^{-6}$	$8 \times 10^{-3}$
Cerium (58)	Ce-141		$9 \times 10^{-4}$
	Ce-143		$4 \times 10^{-4}$
	Ce-144		$1 \times 10^{-4}$
Cesium (55)	Cs-131		$2 \times 10^{-2}$
	Cs-134m		$6 \times 10^{-2}$
	Cs-134		$9 \times 10^{-5}$
Chlorine (17)	Cl-38	$9 \times 10^{-7}$	$4 \times 10^{-3}$
Chromium (24)	Cr-51		$2 \times 10^{-2}$
Cobalt (27)	Co-57		$5 \times 10^{-3}$
	Co-58		$1 \times 10^{-3}$
	Co-60		$5 \times 10^{-4}$
Copper (29)	Cu-64		$3 \times 10^{-3}$

1/ Values are given in Column I only for those materials normally used as gases.

2/  $\mu\text{Ci/gm}$  for solids.

## C. Schedule A

Element (atomic number)	Isotope	Column I	Column II
		Gas Concentration $\mu\text{Ci/ml}^1/$	Liquid and Solid Concentration $\mu\text{Ci/ml}^2/$
Dysprosium (66)	Dy-165		$4 \times 10^{-3}$
	Dy-166		$4 \times 10^{-4}$
Erbium (68)	Er-169		$9 \times 10^{-4}$
	Er-171		$1 \times 10^{-3}$
Europium (63)	Eu-152 (Tr=9.2 hr)		$6 \times 10^{-4}$
	Eu-155		$2 \times 10^{-3}$
Fluorine (9)	F-18	$2 \times 10^{-6}$	$8 \times 10^{-3}$
Gadolinium (64)	Gd-153		$2 \times 10^{-3}$
	Gd-159		$8 \times 10^{-4}$
Gallium (31)	Ga-72		$4 \times 10^{-4}$
Germanium (32)	Ge-71		$2 \times 10^{-2}$
Gold (79)	Au-196		$2 \times 10^{-3}$
	Au-198		$5 \times 10^{-4}$
	Au-199		$2 \times 10^{-3}$
Hafnium (72)	Hf-181		$7 \times 10^{-4}$
Hydrogen (1)	H-3	$5 \times 10^{-6}$	$3 \times 10^{-2}$
Indium (49)	In-113m		$1 \times 10^{-2}$
	In-114m		$2 \times 10^{-4}$
Iodine (53)	I-126	$3 \times 10^{-9}$	$2 \times 10^{-5}$
	I-131	$3 \times 10^{-9}$	$2 \times 10^{-5}$
	I-132	$8 \times 10^{-8}$	$6 \times 10^{-4}$
	I-133	$1 \times 10^{-8}$	$7 \times 10^{-5}$
	I-134	$2 \times 10^{-7}$	$1 \times 10^{-3}$
Iridium (77)	Ir-190		$2 \times 10^{-3}$
	Ir-192		$4 \times 10^{-4}$
	Ir-194		$3 \times 10^{-4}$
Iron (26)	Fe-55		$8 \times 10^{-3}$
	Fe-59		$6 \times 10^{-4}$
Krypton (36)	Kr-85m	$1 \times 10^{-6}$	
	Kr-85	$3 \times 10^{-6}$	
Lanthanum (57)	La-140		$2 \times 10^{-4}$
Lead (82)	Pb-203		$4 \times 10^{-3}$
Lutetium (71)	Lu-177		$1 \times 10^{-3}$
Manganese (25)	Mn-52		$3 \times 10^{-4}$
	Mn-54		$1 \times 10^{-3}$
	Mn-56		$1 \times 10^{-3}$

1/ Values are given in Column I only for those materials normally used as gases.

2/  $\mu\text{Ci/gm}$  for solids.

## C. Schedule A

Element (atomic number)	Isotope	Column I	Column II
		Gas Concentration $\mu\text{Ci/ml}^{1/}$	Liquid and Solid Concentration $\mu\text{Ci/ml}^{2/}$
Mercury (80)	Hg-197m		$2 \times 10^{-3}$
	Hg-197		$3 \times 10^{-3}$
	Hg-203		$2 \times 10^{-4}$
Molybdenum (42)	Mo-99		$2 \times 10^{-3}$
Neodymium (60)	Nd-147		$6 \times 10^{-4}$
	Nd-149		$3 \times 10^{-3}$
Nickel (28)	Ni-65		$1 \times 10^{-3}$
Niobium (Columbium) (41)	Nb-95		$1 \times 10^{-3}$
	Nb-97		$9 \times 10^{-3}$
Osmium (76)	Os-185		$7 \times 10^{-4}$
	Os-191m		$3 \times 10^{-2}$
	Os-191		$2 \times 10^{-3}$
	Os-193		$6 \times 10^{-4}$
Palladium (46)	Pd-103		$3 \times 10^{-3}$
	Pd-109		$9 \times 10^{-4}$
Phosphorus (15)	P-32		$2 \times 10^{-4}$
Platinum (78)	Pt-191		$1 \times 10^{-3}$
	Pt-193m		$1 \times 10^{-2}$
	Pt-197m		$1 \times 10^{-2}$
	Pt-197		$1 \times 10^{-3}$
Potassium (19)	K-42		$3 \times 10^{-3}$
Praseodymium (59)	Pr-142		$3 \times 10^{-4}$
	Pr-143		$5 \times 10^{-4}$
Promethium (61)	Pm-147		$2 \times 10^{-3}$
	Pm-149		$4 \times 10^{-4}$
Rhenium (75)	Re-183		$6 \times 10^{-3}$
	Re-186		$9 \times 10^{-4}$
	Re-188		$6 \times 10^{-4}$
Rhodium (45)	Rh-103m		$1 \times 10^{-1}$
	Rh-105		$1 \times 10^{-3}$
Rubidium (37)	Rb-86		$7 \times 10^{-4}$
Ruthenium (44)	Ru-97		$4 \times 10^{-3}$
	Ru-103		$8 \times 10^{-4}$
	Ru-105		$1 \times 10^{-3}$
	Ru-106		$1 \times 10^{-4}$
Samarium (62)	Sm-153		$8 \times 10^{-4}$

1/ Values are given in Column I only for those materials normally used as gases.

2/  $\mu\text{Ci/gm}$  for solids.

C. Schedule A

Element (atomic number)	Isotope	Column I	Column II
		Gas Concentration $\mu\text{Ci/ml}^1/$	Liquid and Solid Concentration $\mu\text{Ci/ml}^2/$
Scandium (21)	Sc-46		$4 \times 10^{-4}$
	Sc-47		$9 \times 10^{-4}$
	Sc-48		$3 \times 10^{-4}$
Selenium (34)	Se-75		$3 \times 10^{-3}$
Silicon (14)	Si-31		$9 \times 10^{-3}$
Silver (47)	Ag-105		$1 \times 10^{-3}$
	Ag-110m		$3 \times 10^{-4}$
	Ag-111		$4 \times 10^{-4}$
Sodium (11)	Na-24		$2 \times 10^{-3}$
Strontium (38)	Sr-85		$1 \times 10^{-3}$
	Sr-91		$7 \times 10^{-4}$
	Sr-92		$7 \times 10^{-4}$
Sulfur (16)	S-35	$9 \times 10^{-8}$	$6 \times 10^{-4}$
Tantalum (73)	Ta-182		$4 \times 10^{-4}$
Technetium (43)	Tc-96m		$1 \times 10^{-1}$
	Sr-89		$1 \times 10^{-4}$
	Tc-96		$1 \times 10^{-3}$
Tellurium (52)	Te-125m		$2 \times 10^{-3}$
	Te-127m		$6 \times 10^{-4}$
	Te-127		$3 \times 10^{-3}$
	Te-129m		$3 \times 10^{-4}$
	Te-131m		$6 \times 10^{-4}$
	Te-132		$3 \times 10^{-4}$
Terbium (65)	Tb-160		$4 \times 10^{-4}$
Thallium (81)	Tl-200		$4 \times 10^{-3}$
	Tl-201		$3 \times 10^{-3}$
	Tl-202		$1 \times 10^{-3}$
	Tl-204		$1 \times 10^{-3}$
Thulium (69)	Tm-170		$5 \times 10^{-4}$
	Tm-171		$5 \times 10^{-3}$
Tin (50)	Sn-113		$9 \times 10^{-4}$
	Sn-125		$2 \times 10^{-4}$
Tungsten (Wolfram) (74)	W-181		$4 \times 10^{-3}$
	W-187		$7 \times 10^{-4}$
Vanadium (23)	V-48		$3 \times 10^{-4}$

1/ Values are given in Column I only for those materials normally used as gases.

2/  $\mu\text{Ci/gm}$  for solids.

C. Schedule A

Element (atomic number)	Isotope	Column I Gas Concentration $\mu\text{Ci/ml}^1/$	Column II Liquid and Solid Concentration $\mu\text{Ci/ml}^2/$
Xenon (54)	Xe-131m	$4 \times 10^{-6}$	
	Xe-133	$3 \times 10^{-6}$	
	Xe-135	$1 \times 10^{-6}$	
Ytterbium (70)	Yb-175		$1 \times 10^{-3}$
Yttrium (39)	Y-90		$2 \times 10^{-4}$
	Y-91m		$3 \times 10^{-2}$
	Y-91		$3 \times 10^{-4}$
	Y-92		$6 \times 10^{-4}$
	Y-93		$3 \times 10^{-4}$
Zinc (30)	Zn-65		$1 \times 10^{-3}$
	Zn-69m		$7 \times 10^{-4}$
	Zn-69		$2 \times 10^{-2}$
Zirconium (40)	Zr-95		$6 \times 10^{-4}$
	Zr-97		$2 \times 10^{-4}$
Beta and/or gamma emitting radioactive material not listed above with half-life less than 3 years		$1 \times 10^{-10}$	$1 \times 10^{-6}$

1/ Values are given in Column I only for those materials normally used as gases.

2/  $\mu\text{Ci/gm}$  for solids.

NOTE 1: Many radioisotopes disintegrate into isotopes, which are also radioactive. In expressing the concentrations in Schedule A the activity stated is that of the parent isotope and takes into account the daughters.

NOTE 2: For purposes of Part C. where there is involved a combination of isotopes, the limit for the combination should be derived as follows: Determine for each isotope in the product the ratio between the radioactivity concentration present in the product and the exempt radioactivity concentration established in Schedule A for the specific isotope when not in combination. The sum of such ratios may not exceed "1" (i.e., unity).

**EXAMPLE:**

$$\frac{\text{Concentration of Isotope A in Product}}{\text{Exempt concentration of Isotope A}} +$$

$$\frac{\text{Concentration of Isotope B in Product}}{\text{Exempt concentration of Isotope B}} = 1$$

NOTE 3: To convert  $\mu\text{Ci/ml}$  to SI units of megabecquerels per liter multiply the above values by 37.

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# SCHEDULE B

## EXEMPT QUANTITIES OF INDIVIDUAL RADIOACTIVE MATERIALS (C.3.B)

Radioactive Material	MicroCuries	Radioactive Material	MicroCuries
Antimony-122 (Sb 122)	100	Gallium-67 (Ga 67)	100
Antimony-124 (Sb 124)	10	Gallium-72 (Ga 72)	10
Antimony-125 (Sb 125)	10	Germanium-68 (Ge 68)	10
Arsenic-73 (As 73)	100	Germanium-71 (Ge 71)	100
Arsenic-74 (As 74)	10	Gold-195 (Au 195)	10
Arsenic-76 (As 76)	10	Gold-198 (Au 198)	100
Arsenic-77 (As 77)	100	Gold-199 (Au 199)	100
Barium-131 (Ba 131)	10	Hafnium-181 (Hf 181)	10
Barium-133 (Ba 133)	10	Holmium-166 (Ho 166)	100
Barium-140 (Ba 140)	10	Hydrogen-3 (H 3)	1,000
Bismuth-210 (Bi 210)	1	Indium-111 (In 111)	100
Bromine-82 (Br 82)	10	Indium-113m (In 113m)	100
Cadmium-109 (Cd 109)	10	Indium-114m (In 114m)	10
Cadmium-115m (Cd 115m)	10	Indium-115m (In 115m)	100
Cadmium-115 (Cd 115)	100	Indium-115 (In 115)	10
Calcium-45 (Ca 45)	10	Iodine-123 (I 123)	100
Calcium-47 (Ca 47)	10	Iodine-125 (I 125)	1
Carbon-14 (C 14)	100	Iodine-126 (I 126)	1
Cerium-141 (Ce 141)	100	Iodine-129 (I 129)	0.1
Cerium-143 (Ce 143)	100	Iodine-131 (I 131)	1
Cerium-144 (Ce 144)	1	Iodine-132 (I 132)	10
Cesium-129 (Cs 129)	100	Iodine-133 (I 133)	1
Cesium-131 (Cs 131)	1,000	Iodine-134 (I 134)	10
Cesium-134m (Cs 134m)	100	Iodine-135 (I 135)	10
Cesium-134 (Cs 134)	1	Iridium-192 (Ir 192)	10
Cesium-135 (Cs 135)	10	Iridium-194 (Ir 194)	100
Cesium-136 (Cs 136)	10	Iron-52 (Fe 52)	10
Cesium-137 (Cs 137)	10	Iron-55 (Fe 55)	100
Chlorine-36 (Cl 36)	10	Iron-59 (Fe 59)	10
Chlorine-38 (Cl 38)	10	Krypton-85 (Kr 85)	100
Chromium-51 (Cr 51)	1,000	Krypton-87 (Kr 87)	10
Cobalt-57 (Co 57)	100	Lanthanum-140 (La 140)	10
Cobalt-58m (Co 58m)	10	Lutetium-177 (Lu 177)	100
Cobalt-58 (Co 58)	10	Manganese-52 (Mn 52)	10
Cobalt-60 (Co 60)	1	Manganese-54 (Mn 54)	10
Copper-64 (Cu 64)	100	Manganese-56 (Mn 56)	10
Dysprosium-165 (Dy 165)	10	Mercury-197m (Hg 197m)	100
Dysprosium-166 (Dy 166)	100	Mercury-197 (Hg 197)	100
Erbium-169 (Er 169)	100	Mercury-203 (Hg 203)	10
Erbium-171 (Er 171)	100	Molybdenum-99 (Mo 99)	100
Europium-152(Eu152)9.2h	100	Neodymium-147 (Nd 147)	100
Europium-152(Eu152)13yr	1	Neodymium-149 (Nd 149)	100
Europium-154 (Eu 154)	1	Nickel-59 (Ni 59)	100
Europium-155 (Eu 155)	10	Nickel-63 (Ni 63)	10
Fluorine-18 (F 18)	1,000	Nickel-65 (Ni 65)	100
Gadolinium-153 (Gd 153)	10	Niobium-93m (Nb 93m)	10
Gadolinium-159 (Gd 159)	100	Niobium-95 (Nb 95)	10

C.Schedule B

Radioactive Material	MicroCuries	Radioactive Material	MicroCuries
Niobium-97 (Nb 97)	10	Strontium 92 (Sr 92)	10
Osmium-185 (Os 185)	10	Sulphur-35 (S 35)	100
Osmium-191m (Os 191m)	100	Tantalum-182 (Ta 182)	10
Osmium-191 (Os 191)	100	Technetium-96 (Tc 96)	10
Osmium-193 (Os 193)	100	Technetium-97m (Tc 97m)	100
Palladium-103 (Pd 103)	100	Technetium-97 (Tc 97)	100
Palladium-109 (Pd 109)	100	Technetium-99m (Tc 99m)	100
Phosphorus-32 (P 32)	10	Technetium-99 (Tc 99)	10
Platinum-191 (Pt 191)	100	Tellurium-125m (Te 125m)	10
Platinum-193m (Pt 193m)	100	Tellurium-127m (Te 127m)	10
Platinum-193 (Pt 193)	100	Tellurium-127 (Te 127)	100
Platinum-197m (Pt 197m)	100	Tellurium-129m (Te 129m)	10
Platinum-197 (Pt 197)	100	Tellurium-129 (Te 129)	100
Polonium-210 (Po 210)	0.1	Tellurium-131m (Te 131m)	10
Potassium-42 (K 42)	10	Tellurium-132 (Te 132)	10
Potassium-43 (K 43)	10	Terbium-160 (Tb 160)	10
Praseodymium-142 (Pr 142)	100	Thallium-200 (Tl 200)	100
Praseodymium-143 (Pr 143)	100	Thallium-201 (Tl 201)	100
Promethium-147 (Pm 147)	10	Thallium-202 (Tl 202)	100
Promethium-149 (Pm 149)	10	Thallium-204 (Tl 204)	10
Rhenium-186 (Re 186)	100	Thulium-170 (Tm 170)	10
Rhenium-188 (Re 188)	100	Thulium-171 (Tm 171)	10
Rhodium-103m (Rh 103m)	100	Tin-113 (Sn 113)	10
Rhodium-105 (Rh 105)	100	Tin-125 (Sn 125)	10
Rubidium-81 (Rb 81)	10	Tungsten-181 (W 181)	10
Rubidium-86 (Rb 86)	10	Tungsten-185 (W 185)	10
Rubidium-87 (Rb 87)	10	Tungsten-187 (W 187)	100
Ruthenium-97 (Ru 97)	100	Vanadium-48 (V 48)	10
Ruthenium-103 (Ru 103)	10	Xenon-131m (Xe 131m)	1,000
Ruthenium-105 (Ru 105)	10	Xenon-133 (Xe 133)	100
Ruthenium-106 (Ru 106)	1	Xenon-135 (Xe 135)	100
Samarium-151 (Sm 151)	10	Ytterbium-175 (Yb 175)	100
Samarium-153 (Sm 153)	100	Yttrium-87 (Y 87)	10
Scandium-46 (Sc 46)	10	Yttrium-88 (Y 88)	10
Scandium-47 (Sc 47)	100	Yttrium-90 (Y 90)	10
Scandium-48 (Sc 48)	10	Yttrium-91 (Y 91)	10
Selenium-75 (Se 75)	10	Yttrium-92 (Y 92)	100
Silicon-31 (Si 31)	100	Yttrium-93 (Y 93)	100
Silver-105 (Ag 105)	10	Zinc-65 (Zn 65)	10
Silver-110m (Ag 110m)	1	Zinc-69m (Zn 69m)	100
Silver-111 (Ag 111)	100	Zinc-69 (Zn 69)	1,000
Sodium-22 (Na 22)	10	Zirconium-93 (Zr 93)	10
Sodium-24 (Na 24)	10	Zirconium-95 (Zr 95)	10
Strontium-85 (Sr 85)	10	Zirconium-97 (Zr 97)	10
Strontium-89 (Sr 89)	1		
Strontium 90 (Sr 90)	0.1	Any radioactive material not listed above	
Strontium 91 (Sr 91)	10	other than alpha emitting radioactive material	0.1

NOTE: To convert microcuries (μCi) to SI units of kilobecquerels (kBq), multiply the above by 37.

## SCHEDULE C

### LIMITS FOR BROAD LICENSES (C.10)

Radioactive Material	Col I* Curies	Col II** Curies	Radioactive Material	Col I* Curies	Col II** Curies
Antimony-122	1	0.01	Gallium-72	10	0.1
Antimony-124	1	0.01	Germanium-71	100	1
Antimony-125	1	0.01	Gold-198	10	0.1
Arsenic-73	10	0.1	Gold-199	10	0.1
Arsenic-74	1	0.01	Hafnium-181	1	0.01
Arsenic-76	1	0.01	Holmium-166	10	0.1
Arsenic-77	10	0.1	Hydrogen-3	100	1
Barium-131	10	0.1	Indium-113m	100	1
Barium-140	1	0.01	Indium-114m	1	0.01
Beryllium-7	10	0.1	Indium-115m	100	1
Bismuth-210	0.1	0.001	Indium-115	1	0.01
Bromine-82	10	0.1	Iodine-125	0.1	0.001
Cadmium-109	1	0.01	Iodine-126	0.1	0.001
Cadmium-115m	1	0.01	Iodine-129	0.1	0.001
Cadmium-115	10	0.1	Iodine-131	0.1	0.001
Calcium-45	1	0.01	Iodine-132	10	0.1
Calcium-47	10	0.1	Iodine-133	1	0.01
Carbon-14	100	1	Iodine-134	10	0.1
Cerium-141	10	0.1	Iodine-135	1	0.01
Cerium-143	10	0.1	Iridium-192	1	0.01
Cerium-144	0.1	0.001	Iridium-194	10	0.1
Cesium-131	100	1	Iron-55	10	0.1
Cesium-134m	100	1	Iron-59	1	0.01
Cesium-134	0.1	0.001	Krypton-85	100	1
Cesium-135	1	0.01	Krypton-87	10	0.1
Cesium-136	10	0.1	Lanthanum-140	1	0.01
Cesium-137	0.1	0.001	Lutetium-177	10	0.1
Chlorine-36	1	0.01	Manganese-52	1	0.01
Chlorine-38	100	1	Manganese-54	1	0.01
Chromium-51	100	1	Manganese-56	10	0.1
Cobalt-57	10	0.1	Mercury-197m	10	0.1
Cobalt-58m	100	1	Mercury-197	10	0.1
Cobalt-58	1	0.01	Mercury-203	1	0.01
Cobalt-60	0.1	0.001	Molybdenum-99	10	0.1
Copper-64	10	0.1	Neodymium-147	10	0.1
Dysprosium-165	100	1	Neodymium-149	10	0.1
Dysprosium-166	10	0.1	Nickel-59	10	0.1
Erbium-169	10	0.1	Nickel-63	1	0.01
Erbium-171	10	0.1	Nickel-65	10	0.1
Europium-152(9.2h)	10	0.1	Niobium-93m	1	0.01
Europium-152(13y)	0.1	0.001	Niobium-95	1	0.01
Europium-154	0.1	0.001	Niobium-97	100	1
Europium-155	1	0.01	Osmium-185	1	0.01
Fluorine-18	100	1	Osmium-191m	100	1
Gadolinium-153	1	0.01	Osmium-191	10	0.1
Gadolinium-159	10	0.1	Osmium-193	10	0.1

\* Type B Specific license \*\* Type C Specific license

C. SCHEDULE C

Radioactive Material	Col I* Curies	Col II** Curies	Radioactive Material	Col I* Curies	Col II** Curies
Palladium-103	10	0.1	Technetium-96	10	0.1
Palladium-109	10	0.1	Technetium-97m	10	0.1
Phosphorus-32	1	0.01	Technetium-97	10	0.1
Platinum-191	10	0.1	Technetium-99m	100	1
Platinum-193m	100	1	Technetium-99	1	0.01
Platinum-193	10	0.1	Tellurium-125m	1	0.01
Platinum 197m	100	1	Tellurium-127m	1	0.01
Platinum-197	10	0.1	Tellurium-127	10	0.1
Polonium-210	0.01	0.0001	Tellurium-129m	1	0.01
Potassium-42	1	0.01	Tellurium-129	100	1
Praseodymium-142	10	0.1	Tellurium-131m	10	0.1
Praseodymium-143	10	0.1	Tellurium-132	1	0.01
Promethium-147	1	0.01	Terbium-160	1	0.01
Promethium-149	10	0.1	Thallium-200	10	0.1
Radium-226	0.01	0.0001	Thallium-201	10	0.1
Rhenium-186	10	0.1	Thallium-202	10	0.1
Rhenium-188	10	0.1	Thallium-204	1	0.01
Rhodium-103m	1,000	10	Thulium-170	1	0.01
Rhodium-105	10	0.1	Thulium-171	1	0.01
Rubidium-86	1	0.01	Tin-113	1	0.01
Rubidium-87	1	0.01	Tin-125	1	0.01
Ruthenium-97	100	1	Tungsten-181	1	0.01
Ruthenium-103	1	0.01	Tungsten-185	1	0.01
Ruthenium-105	10	0.1	Tungsten-187	10	0.1
Ruthenium-106	0.1	0.001	Vanadium-48	1	0.01
Samarium-151	1	0.01	Xenon-131m	1,000	10
Samarium-153	10	0.1	Xenon-133	100	1
Scandium-46	1	0.01	Xenon-135	100	1
Scandium-47	10	0.1	Ytterbium-175	10	0.1
Scandium-48	1	0.01	Yttrium-90	1	0.01
Selenium-75	1	0.01	Yttrium-91	1	0.01
Silicon-31	10	0.1	Yttrium-92	10	0.1
Silver-105	1	0.01	Yttrium-93	1	0.01
Silver-110m	0.1	0.001	Zinc-65	1	0.01
Silver-111	10	0.1	Zinc-69m	10	0.1
Sodium-22	0.1	0.001	Zinc-69	100	1
Sodium-24	1	0.01	Zirconium-93	1	0.01
Strontium-85m	1,000	10	Zirconium-95	1	0.01
Strontium-85	1	0.01	Zirconium-97	1	0.01
Strontium-89	1	0.01	Any radioactive material other than source material, special nuclear material, or alpha emitting radioactive material not listed above.	0.1	0.001
Strontium-90	0.01	0.0001			
Strontium-91	10	0.1			
Strontium-92	10	0.1			
Sulphur-35	10	0.1			
Tantalum-182	1	0.01			

\* Type B Specific license \*\* Type C Specific license

NOTE 1: To convert curies (Ci) to SI units of gigabecquerels (GBq), multiply the above values by 37.

## SCHEDULE D

### QUANTITIES OF RADIOACTIVE MATERIALS REQUIRING CONSIDERATION OF THE NEED FOR AN EMERGENCY PLAN FOR RESPONDING TO A RELEASE

Radioactive Material	Release Fraction	Quantity (curies)	Radioactive Material	Release Fraction	Quantity (curies)
Actinium-228	0.001	4,000	Indium-114m	0.01	1,000
Americium-241	0.001	2	Iodine-125	0.5	10
Americium-242	0.001	2	Iodine-131	0.5	10
Americium-243	0.001	2	Iridium-192	0.001	40,000
Antimony-124	0.01	4,000	Iron-55	0.01	40,000
Antimony-126	0.01	6,000	Iron-59	0.01	7,000
Barium-133	0.01	10,000	Krypton-85	1	6,000,000
Barium-140	0.01	30,000	Lead-210	0.01	8
Bismuth-207	0.01	5,000	Manganese-56	0.01	60,000
Bismuth-210	0.01	600	Mercury-203	0.01	10,000
Cadmium-109	0.01	1,000	Molybdenum-99	0.01	30,000
Cadmium-113	0.01	80	Neptunium-237	0.001	2
Calcium-45	0.01	20,000	Nickel-63	0.01	20,000
Californium-252	0.001	9 (20 mg)	Niobium-94	0.01	300
Carbon-14 (NonCO <sub>2</sub> )	0.01	50,000	Phosphorus-32	0.5	100
Cerium-141	0.01	10,000	Phosphorus-33	0.5	1,000
Cerium-144	0.01	300	Polonium-210	0.01	10
Cesium-134	0.01	2,000	Potassium-42	0.01	9,000
Cesium-137	0.01	3,000	Promethium-145	0.01	4,000
Chlorine-36	0.5	100	Promethium-147	0.01	4,000
Chromium-51	0.01	300,000	Ruthenium-106	0.01	200
Cobalt-60	0.001	5,000	Samarium-151	0.01	4,000
Copper-64	0.01	200,000	Scandium-46	0.01	3,000
Curium-242	0.001	60	Selenium-75	0.01	10,000
Curium-243	0.001	3	Silver-110m	0.01	1,000
Curium-244	0.001	4	Sodium-22	0.01	9,000
Curium-245	0.001	2	Sodium-24	0.01	10,000
Europium-152	0.01	500	Strontium-89	0.01	3,000
Europium-154	0.01	400	Strontium-90	0.01	90
Europium-155	0.01	3,000	Sulphur-35	0.5	900
Gadolinium-153	0.01	5,000	Technetium-99	0.01	10,000
Germanium-68	0.01	2,000	Technetium-99m	0.01	400,000
Gold-198	0.01	30,000	Tellurium-127m	0.01	5,000
Hafnium-172	0.01	400	Tellurium-129m	0.01	5,000
Hafnium-181	0.01	7,000	Terbium-160	0.01	4,000
Holmium-166m	0.01	100	Thulium-170	0.01	4,000
Hydrogen-3	0.5	20,000	Tin-113	0.01	10,000

C.Schedule D

Radioactive Material <sup>1</sup>	Release Fraction	Quantity (curies)	Radioactive Material	Release Fraction	Quantity (curies)
Tin-123	0.01	3,000	Irradiated material, any form other than solid noncombustible		
Tin-126	0.01	1,000			
Titanium-44	0.01	100		0.01	1,000
Vanadium-48	0.01	7,000	Irradiated material, solid noncombustible	0.001	10,000
Xenon-133	1	900,000	Mixed radioactive waste, beta-gamma <sup>2/</sup>	0.01	1,000
Yttrium-91	0.01	2,000			
Zinc-65	0.01	5,000	Packaged mixed waste, beta-gamma	0.001	10,000
Zirconium-93	0.01	400	Any other alpha emitter	0.001	2
Zirconium-95	0.01	5,000	Contaminated equipment alpha	0.0001	20
Any other beta-gamma emitter	0.01	10,000	Packaged waste, alpha <sup>2/</sup>	0.0001	20
			Combinations of radioactive materials listed above <sup>1/</sup>		
Mixed fission products	0.01	1,000			
Mixed corrosion products	0.01	10,000			
Contaminated equipment beta-gamma	0.001	10,000			

1/ For combinations of radioactive materials, consideration of the need for an emergency plan is required if the sum of the ratios of the quantity of each radioactive material authorized to the quantity listed for that material in schedule C exceeds one.

2/ Waste packaged in Type B containers does not require an emergency plan.

## **APPENDIX A**

### **GENERAL PROVISIONS**

#### **A. Purpose.**

The regulations in this part set out fees charged for licensing services rendered by the State of Maine, Radiation Control Program (the Agency), as authorized under 22 MRSA Section 690 of Maine's Radiation Protection Act.

#### **B. Scope.**

Except for persons who apply for or hold the permits, licenses, or approvals exempted in Part C, the regulations in this section apply to a person who is:

1. An applicant for or holder of a specific byproduct material license, NARM material, source material, or special nuclear material license issued pursuant to Part C of these rules;
2. An applicant for or holder of specific approval of shipping containers issued pursuant to Part L of these rules;
3. An applicant for or holder of a specific approval of sealed sources and devices containing byproduct material, NARM material, source material, or special nuclear material;
4. Required to have routine and non-routine safety and safeguards inspections of activities licensed pursuant to the requirements of these rules; or
5. An applicant for or holder of a license, approval, determination, or other authorization issued by the Agency pursuant to Parts D.22 and D.25 of these rules.
6. An applicant for or holder of a general license established by any of Parts C.5.E, C.6.B, or C.6.F of these rules.

#### **C. Definitions.**

As used in this part:

1. "Materials license" means a byproduct, NARM, or a source material license issued pursuant to Part C of these rules.
2. "Sealed source" means any byproduct material, or NARM material that is encased in a capsule designed to prevent leakage or escape of the material.
3. "Inspection" means:
  - (a) Routine inspections designed to evaluate the licensee's activities within the context of the licensee having primary responsibility for protection of the public and environment.
  - (b) Non-routine inspections in response or reaction to an incident, allegation, follow-up to inspection deficiencies or inspections to determine implementation of safety issues. A non-routine or reactive inspection has the same purpose as the routine inspection.
4. "State agency" means any executive department, commission, independent establishment, corporation, wholly or partly owned by the State of Maine, or any board, bureau, division, service, office, officer, authority, administration, or other establishment in the executive branch of the State.

**D. Exemptions.**

1. No application fees, annual fees, amendment fees , or inspection fees shall be required for:
  - (a) A license authorizing the export only of a production or utilization facility.
  - (b) A license authorizing the export only or import only of byproduct material, source material or special nuclear material.
2. A license authorizing the use of source material as shielding only in devices and containers, provided, however, that all other licensed byproduct material, source material, or special nuclear material in the device or container will be subject to the fees prescribed in Table 1 of this appendix.

**E. Payment of fees.**

1. Application fees. Each application for which a fee is prescribed shall be accompanied by a remittance in the full amount of the fee. No application will be accepted for filing or processed prior to payment of the full amount specified. Applications for which no remittance is received may be returned to the applicant. All application fees will be charged irrespective of the Agency's disposition of the application or withdrawal of the application.
2. Full cost. For each application on which the review charges are based on full costs and the application has been pending with the Agency for six months or longer, the first bill for accumulated costs will be sent and will include all of the applicable review time and contractual costs expended. Thereafter, each applicant will be billed at six-month intervals or when the review is completed, whichever is earlier. Each bill will identify the applications and the costs related to each.
3. Non-routine inspection fees. Non-routine inspection fees are payable upon notification by the Agency. Inspection costs will include preparation time, time on site and documentation time and any associated contractual service costs but will exclude the time involved by the staff in the processing and issuance of a notice of violation or civil penalty.
4. Annual fees. A license fee based upon the type of license, number of sources and/or gauges shall be assessed on an annual basis. The licensee has sixty (60) days from the postmark date of the Radioactive Materials License Annual Fees Invoice notice to submit payment in full unless special arrangements are made with the Agency. Failure to pay the annual fee by the due date will result in a penalty not to exceed 9% of the unpaid fee compounded monthly. Failure to remit full payment within six (6) months could , at the Agency's discretion, result in the initiation of license termination procedures.
5. Method of payment. Fee payments shall be by check, draft, or money order made payable to the Treasurer, State of Maine.

**F. Average cost per professional staff-hour.**

Fees for permits, licenses, amendments, renewals, special projects and inspections will be calculated based upon the full costs for the review.

TABLE 1 to Appendix A

**RADIOACTIVE MATERIALS SPECIFIC LICENSE AND INSPECTION FEE SCHEDULE**

LICENSE CATEGORY	APPLICATION	ANNUAL	NON-ROUTINE INSPECTION
<b>1. Special Nuclear Material</b>			
A. Sealed sources in devices	\$500.00	\$500.00 <sup>5</sup>	\$1,300.00
B. Pacemakers	\$500.00	\$350.00	\$800.00
C. Other except critical	\$690.00	\$1,000.00	\$800.00
D. Termination	\$500.00	Full cost	
<b>2. Source Material</b>			
A. Shielding	\$110.00	\$350.00	\$350.00
B. Other	\$790.00	\$1,000.00	\$1,500.00
C. Termination	\$500.00	Full cost	
<b>3. Byproduct and NARM Material</b>			
A. Processing and Manufacturing for commercial distribution			
1. Broad A	\$2,300.00	\$3,000.00	\$2,100.00
2. Broad B	\$2,300.00	\$3,000.00	\$2,100.00
3. Broad C	\$2,300.00	\$3,000.00	\$2,100.00
4. Other	\$1,300.00	\$1,750.00	\$2,000.00
B. Radiopharmaceuticals, reagent kits, sources and devices			
1. Proc. manu. and distribution	\$3,400.00	\$2,000.00	\$1,900.00
2. Distribution only	\$1,100.00	\$750.00	\$1,200.00
C. Sealed sources for irradiation			
1. Fixed, self shielded	\$500.00	\$500.00	\$690.00
2. Exposed source < 10,000 Ci.	\$1,200.00	\$1,500.00	\$1,300.00
3. Exposed source > 10,000 Ci.	\$4,600.00	\$3,000.00	\$1,400.00
D. Distribution to persons exempt (NARM)			
1. Device review required	\$2,100.00	\$750.00	\$690.00
2. No device review required	\$2,600.00	\$750.00	\$690.00
E. Distribution to persons generally licensed			
1. SSD review required	\$2,500.00	\$750.00	\$690.00
2. No SSD review required	\$1,900.00	\$750.00	\$690.00
F. Research and development, no commercial distribution			
1. Broad A	\$2,300.00	\$1,250.00	\$1,200.00
2. Broad B	\$2,300.00	\$1,000.00	\$1,200.00
3. Broad C	\$2,300.00	\$750.00	\$1,200.00
4. Other	\$1,100.00	\$750.00	\$930.00
G. Services for other licensees	\$1,400.00	\$750.00	\$690.00
H. Industrial radiography	\$3,000.00	\$2,000.00	\$2,500.00
I. All other byproduct and NARM, except 4A through 8D			
1. Portable gauges	\$500.00	\$500.00 <sup>5</sup>	\$1,200.00

C. Appendix A. Table 1

LICENSE CATEGORY	APPLICATION	ANNUAL	NON-ROUTINE INSPECTION
2. Fixed gauges	\$500.00	\$500.00 <sup>5</sup>	\$1,200.00
3. X-ray Fluorescence	\$500.00	\$500.00 <sup>5</sup>	\$1,200.00
4. Laboratory services	\$500.00	\$350.00	\$1,200.00
5. Storage only	\$500.00	\$350.00	\$1,200.00
6. In-Vitro laboratories	\$500.00	\$500.00	\$1,200.00
7. Gas Chromatographs	\$500.00	\$350.00	\$1,200.00
8. Other	\$500.00	\$500.00	\$1,200.00
<b>4. Waste Disposal Services</b>			
A. Packaging or repackaging	\$2,800.00	\$2,500.00	\$1,600.00
B. Transferal to another person	\$1,900.00	\$1,000.00	\$2,100.00
C. Incineration or other treatment	\$500.00 + full cost	Full cost	
<b>5. Well Logging</b>			
A. Well logging and tracer studies	\$3,400.00	\$1,000.00	\$800.00
B. Field flooding tracer studies	\$500.00 + full cost	\$1,750.00	\$1,200.00
<b>6. Nuclear Laundries</b>	\$1,400.00	\$2,000.00	\$1,900.00
<b>7. Human use</b>			
A. Teletherapy Devices	\$3,400.00	\$1,750.00	\$1,900.00
B. Broad Scope	\$2,300.00	\$2,500.00	\$1,800.00
C. Other Human Use			
1. G.100 authorization	\$710.00	\$750.00	\$1,500.00
2. G.200 authorization	\$710.00	\$1000.00 <sup>6</sup>	\$1,500.00
3. G.300 authorization	\$710.00	\$1000.00 <sup>6</sup>	\$1,500.00
4. G.400 authorization	\$710.00	\$1000.00 <sup>6</sup>	\$1,500.00
5. G.500 authorization	\$710.00	\$500.00	\$1,500.00
6. Mobile Nuclear Van	\$710.00	\$1,200.00	\$1,500.00
7. HDR Brachytherapy	\$710.00	\$1,750.00	\$1,900.00
8. Gamma Knife Devices	\$710.00	\$1,750.00	\$1,900.00
<b>8. Civil Defense Activities</b>	\$580.00	\$350.00	\$690.00
<b>9. Device, product or sealed source safety evaluation</b>			
A. Devices, for commercial dist.	\$3,300.00		
B. Devices, single applicant	\$2,000.00		
C. Sources, for commercial dist.	\$750.00		
D. Sources, single applicant	\$750.00		
<b>10. General license registration</b>			
A. Submission of form HHE-860	\$100.00	\$100.00	\$1200.00
B. Submission of form HHE-861	\$25.00	\$25.00	\$1200.00
C. Submission of form HHE-862	\$100.00	\$100.00	\$1200.00
D. Submission of form HHE-863	\$100.00	\$100.00	\$1200.00
E. Submission of form HHE-867	\$100.00	\$100.00	\$1200.00

**C. Appendix A**

1. Types of material license fees - Separate charges as shown in the schedule will be assessed for applications for new licenses and approvals, issuance of new licenses and approvals, and amendments to existing licenses and approvals. The following guidelines apply to these charges:
  - (a) Application fees - Applications for materials licenses and approvals must be accompanied by the prescribed application fee for each category, except that applications for licenses covering more than one fee category of special nuclear material or source material to be used at the same location, must be accompanied by the prescribed application fee for the highest fee category. When a license or approval has expired, the application fee for each category shall be due, except for licenses covering more than one fee category of special nuclear material or source material for use at the same location, in which case the application fee for the highest category applies.
  - (b) License/approval fees - For new licenses and approvals issued in fee Categories 1D 2C, 4C, and 5B, the recipient shall pay the license or approval fee for each category, as determined by the Agency in accordance with Part E of this Appendix except that a license covering more than one fee category of special nuclear material in Categories 1A through 1D or source material in fee Categories 2A through 2C must pay a license fee for the highest fee category assigned to the license.
  - (c) Amendment fees - Applications for amendments must be accompanied by the minimum amendment fee of \$50.00. The Agency will compute the final amendment fee based upon actual costs, but not more than \$500.00, and the applicant will be billed at the completion of the licensing action.
2. Material license fees will not be charged for orders issued by the Agency pursuant to Part B.8 nor for amendments resulting specifically from such orders. However, fees will be charged for approvals issued pursuant to a specific exemption provision of the Agency's regulations regardless of whether the approval is in the form of a license amendment, letter of approval, safety evaluation report, or other form. In addition to the fee shown, an applicant may be assessed an additional fee for sealed source and device evaluations as shown in Categories 9A through 9D.
3. Types of inspections - Separate charges as shown in this schedule will be the maximum amount assessed for each non-routine inspection, which is performed. The amount that will be charged to the licensee will be based on the staff time and contractual costs expended by the agency.
4. A licensee who is authorized to use licensed radioactive materials at multiple locations that are not immediately adjacent, or on the same campus, will be assessed an additional 25% of their annual fee.
5. The following scale of additional fees will be added to the stated annual fee as applicable from the licensed quantity. If a licensee is authorized for use under fee categories 1.A, 3.I.1, and/or 3.I.3 the total number of gauges authorized under all types are cumulative. If more than one of the remaining fee categories also applies to a licensee only the highest fee will be charged .

<b>License Categories</b>	<b>1 to 5 gauges</b>	<b>6 to 15 gauges</b>	<b>16 gauges plus</b>
<b>1.A.</b>	0	\$250.00	\$500.00
<b>3.I.1.</b>	0	\$250.00	\$500.00
<b>3.I.3.</b>	0	\$250.00	\$500.00
<b>License Category</b>	<b>1 to 10 gauges</b>	<b>11 to 30 gauges</b>	<b>31 gauges plus</b>
<b>3.I.2.</b>	0	\$250.00	\$500.00

6. The license fee categories 7.C.1 through 7.C.5 will be charged the stated fee if any of the categories are authorized singly. If multiple categories are authorized an additional fee of \$250.00 per category will be added to the annual fee of the highest fee category. If any of the categories 7.C.2 through 7.C.4 are authorized then authorization for 7.C.1 will not incur an additional fee.

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## APPENDIX B

### NATURALLY OCCURRING OR ACCELERATOR PRODUCED RADIOACTIVE MATERIAL (NARM)

Examples of Naturally Occurring Radioactive Materials. (Naturally occurring radioactive material is any material of natural origin that emits radiation spontaneously, excluding uranium, thorium, and the tailings produced in their extraction)

Hydrogen-3	Indium-115	Lead-210
Beryllium-7	Lanthanum-138	Lead-212
Beryllium-10	Cerium-142	Bismuth-210
Carbon-14	Neodymium-144	Bismuth-212
Sodium-22	Samarium-147	Polonium-210
Silicon-32	Samarium-148	Radon-220
Phosphorus-32	Samarium-149	Radon-222
Phosphorus-33	Gadolinium-152	Radium-224
Sulfur-35	Hafnium-174	Radium-226
Chlorine-36	Lutetium-176	Radium-228
Chlorine-39	Rhenium-187	Actinium-227
Potassium-40	Platinum-190	Actinium-228
Vanadium-50	Platinum-192	Protoactinium-231
Rubidium-87	Lead-204	

Examples of Accelerator-Produced Radioactive Materials. (Accelerator- produced radioactive material is any material made radioactive (emits radiation spontaneously) by a particle accelerator)

Carbon-11	Zinc-62	Iodine-124
Nitrogen-13	Gallium-66	Iodine-125*
Oxygen-15	Gallium-67	Iodine-126
Fluorine-18	Germanium-68	Xenon-127
Sodium-22	Arsenic-73	Cesium-131
Magnesium-28	Selenium-73	Promethium-145
Aluminum-28	Bromine-77	Dysprosium-157
Phosphorus-33	Krypton-77	Osmium-190
Argon-37	Krypton-81	Iridium-190
Potassium-43	Rubidium-81	Iridium-190m
Scandium-49	Rubidium-82	Platinum-193m
Manganese-52	Rubidium-84	Gold-195
Iron-52	Strontium-82	Mercury-197
Cobalt-57	Strontium-87m	Thallium-199
Cobalt-58	Yttrium-87	Thallium-201
Copper-62	Technetium-97m	Lead-203
Copper-67	Indium-111	Bismuth-204
Zinc-62	Iodine-123	

\* Excludes Iodine-125 as byproduct material, which requires licensing by either the U.S. Nuclear Regulatory Commission or an Agreement State.

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# Appendix C

## Criteria Relating to Use of Financial Tests and Parent Company Guarantees for Providing Reasonable Assurance of Funds for Decommissioning

### A. Introduction

An applicant or licensee may provide reasonable assurance of the availability of funds for decommissioning based on obtaining a parent company guarantee that funds will be available for decommissioning costs and on a demonstration that the parent company passes a financial test. This appendix establishes criteria for passing the financial test and for obtaining the parent company guarantee.

### B. Financial Test

1. To pass the financial test, the parent company must meet the criteria of either paragraph 1.a or 2.a of this section:

a. The parent company must have:

- (1) Two of the following three ratios: A ratio of total liabilities to net worth less than 2.0; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; and a ratio of current assets to current liabilities greater than 1.5; and
- (2) Net working capital and tangible net worth each at least six times the current decommissioning cost estimates for the total of all facilities or parts thereof (or prescribed amount if a certification is used), or, for a power reactor licensee, at least six times the amount of decommissioning funds being assured by a parent company guarantee for the total of all reactor units or parts thereof (Tangible net worth shall be calculated to exclude the net book value of the nuclear unit(s)); and
- (3) Tangible net worth of at least \$10 million; and
- (4) Assets located in the United States amounting to at least 90 percent of the total assets or at least six times the current decommissioning cost estimates for the total of all facilities or parts thereof (or prescribed amount if a certification is used), or, for a power reactor licensee, at least six times the amount of decommissioning funds being assured by a parent company guarantee for the total of all reactor units or parts thereof.

b. The parent company must have:

- (1) A current rating for its most recent bond issuance of AAA, AA, A, or BBB as issued by Standard and Poor's or AAA, AA, A, or BAA as issued by Moody's; and
- (2) Tangible net worth each at least six times the current decommissioning cost estimates for the total of all facilities or parts thereof (or prescribed amount if a certification is used), or, for a power reactor licensee, at least six times the amount of decommissioning funds being assured by a parent company guarantee for the total of all reactor units or parts thereof (Tangible net worth shall be calculated to exclude the net book value of the nuclear unit(s)); and
- (3) Tangible net worth of at least \$10 million; and
- (4) Assets located in the United States amounting to at least 90 percent of the total assets or at least six times the current decommissioning cost estimates for the total of all facilities or parts thereof (or prescribed amount if a certification is used), or, for a power reactor licensee, at least six times the amount of decommissioning funds being assured by a parent company guarantee for the total of all reactor units or parts thereof.

**C.Appendix C.**

2. The parent company's independent certified public accountant must have compared the data used by the parent company in the financial test, which is derived from the independently audited, year end financial statements for the latest fiscal year, with the amounts in such financial statement. In connection with that procedure the licensee shall inform the Agency within 90 days of any matters coming to the auditor's attention which cause the auditor to believe that the data specified in the financial test should be adjusted and that the company no longer passes the test.
3. a. After the initial financial test, the parent company must repeat the passage of the test within 90 days after the close of each succeeding fiscal year.
  - b. If the parent company no longer meets the requirements of paragraph A of this section, the licensee must send notice to the Agency of intent to establish alternate financial assurance as specified in the Agency's regulations. The notice must be sent by certified mail within 90 days after the end of the fiscal year for which the year end financial data show that the parent company no longer meets the financial test requirements. The licensee must provide alternate financial assurance within 120 days after the end of such fiscal year.

### **C. Parent Company Guarantee**

The terms of a parent company guarantee which an applicant or licensee obtains must provide that:

1. The parent company guarantee will remain in force unless the guarantor sends notice of cancellation by certified mail to the licensee and the Agency. Cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of cancellation by both the licensee and the Agency, as evidenced by the return receipts.
2. If the licensee fails to provide alternate financial assurance as specified in the Agency's regulations within 90 days after receipt by the licensee and Agency of a notice of cancellation of the parent company guarantee from the guarantor, the guarantor will provide such alternative financial assurance in the name of the licensee.
3. The parent company guarantee and financial test provisions must remain in effect until the Agency has terminated the license.
4. If a trust is established for decommissioning costs, the trustee and trust must be acceptable to the Agency. An acceptable trustee includes an appropriate State or Federal Government agency or an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency.

## Appendix D

### Criteria Relating to Use of Financial Tests and Self Guarantees for Providing Reasonable Assurance of Funds for Decommissioning

#### A. Introduction

An applicant or licensee may provide reasonable assurance of the availability of funds for decommissioning based on furnishing its own guarantee that funds will be available for decommissioning costs and on a demonstration that the company passes the financial test of Section B of this appendix. The terms of the self-guarantee are in Section C of this appendix. This appendix establishes criteria for passing the financial test for the self guarantee and establishes the terms for a self-guarantee.

#### B. Financial Test

1. To pass the financial test, a company must meet all of the following criteria:
  - a. Tangible net worth at least 10 times the total current decommissioning cost estimate for the total of all facilities or parts thereof (or the current amount required if certification is used), or, for a power reactor licensee, at least 10 times the amount of decommissioning funds being assured by a self guarantee, for all decommissioning activities for which the company is responsible as self-guaranteeing licensee and as parent-guarantor for the total of all reactor units or parts thereof (Tangible net worth shall be calculated to exclude the net book value of the nuclear unit(s)).
  - b. Assets located in the United States amounting to at least 90 percent of total assets or at least 10 times the total current decommissioning cost estimate for the total of all facilities or parts thereof (or the current amount required if certification is used), or, for a power reactor licensee, at least 10 times the amount of decommissioning funds being assured by a self guarantee, for all decommissioning activities for which the company is responsible as self-guaranteeing licensee and as parent-guarantor for the total of all reactor units or parts thereof.
  - c. A current rating for its most recent bond issuance of AAA, AA, or A as issued by Standard and Poors (S&P), or Aaa, Aa, or A as issued by Moodys.
2. To pass the financial test, a company must meet all of the following additional requirements:
  - a. The company must have at least one class of equity securities registered under the Securities Exchange Act of 1934.
  - b. The company's independent certified public accountant must have compared the data used by the company in the financial test which is derived from the independently audited, yearend financial statements for the latest fiscal year, with the amounts in such financial statement. In connection with that procedure, the licensee shall inform the Agency within 90 days of any matters coming to the attention of the auditor that cause the auditor to believe that the data specified in the financial test should be adjusted and that the company no longer passes the test.
  - c. After the initial financial test, the company must repeat passage of the test within 90 days after the close of each succeeding fiscal year.
3. If the licensee no longer meets the requirements of Section B.2. of this appendix, the licensee must send immediate notice to the Agency of its intent to establish alternate financial assurance as specified in the Agency's regulations within 120 days of such notice.

**C. Company Self-Guarantee**

The terms of a self-guarantee which an applicant or licensee furnishes must provide that:

1. The guarantee will remain in force unless the licensee sends notice of cancellation by certified mail to the Agency. Cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of cancellation by the Agency, as evidenced by the return receipt.
2. The licensee shall provide alternative financial assurance as specified in the Agency's regulations within 90 days following receipt by the Agency of a notice of cancellation of the guarantee.
3. The guarantee and financial test provisions must remain in effect until the Agency has terminated the license or until another financial assurance method acceptable to the Agency has been put in effect by the licensee.
4. The licensee will promptly forward to the Agency and the licensee's independent auditor all reports covering the latest fiscal year filed by the licensee with the Securities and Exchange Commission pursuant to the requirements of section 13 of the Securities and Exchange Act of 1934.
5. If, at any time, the licensee's most recent bond issuance ceases to be rated in any category of "A" or above by either Standard and Poors or Moodys, the licensee will provide notice in writing of such fact to the Agency within 20 days after publication of the change by the rating service. If the licensee's most recent bond issuance ceases to be rated in any category of A or above by both Standard and Poors and Moodys, the licensee no longer meets the requirements of Section B.1. of this appendix.
6. The applicant or licensee must provide to the Agency a written guarantee (a written commitment by a corporate officer) which states that the licensee will fund and carry out the required decommissioning activities or, upon issuance of an order by the Agency, the licensee will set up and fund a trust in the amount of the current cost estimates for decommissioning.

**APPENDIX E**

**QUANTITIES FOR USE WITH DECOMMISSIONING**

Material	Microcurie *	Material	Microcurie*
Americium-241	0.01	Germanium-71	100
Antimony-122	100	Gold-198	100
Antimony-124	10	Gold-199	100
Antimony-125	10	Hafnium-181	10
Arsenic-73	100	Holmium-166	100
Arsenic-74	10	Hydrogen-3	1,000
Arsenic-76	10	Indium-113m	100
Arsenic-77	100	Indium-114m	10
Barium-131	10	Indium-115m	100
Barium-133	10	Indium-115	10
Barium-140	10	Iodine-125	1
Bismuth-210	1	Iodine-126	1
Bromine-82	10	Iodine-129	0.1
Cadmium-109	10	Iodine-131	1
Cadmium-115m	10	Iodine-132	10
Cadmium-115	100	Iodine-133	1
Calcium-45	10	Iodine-134	10
Calcium-47	10	Iodine-135	10
Carbon-14	100	Iridium-192	10
Cerium-141	100	Iridium-194	100
Cerium-143	100	Iron-55	100
Cerium-144	1	Iron-59	10
Cesium-131	1,000	Krypton-85	100
Cesium-134m	100	Krypton-87	10
Cesium-134	1	Lanthanum-140	10
Cesium-135	10	Lutetium-177	100
Cesium-136	10	Manganese-52	10
Cesium-137	10	Manganese-54	10
Chlorine-36	10	Manganese-56	10
Chlorine-38	10	Mercury-197m	100
Chromium-51	1,000	Mercury-197	100
Cobalt-58m	10	Mercury-203	10
Cobalt-58	10	Molybdenum-99	100
Cobalt-60	1	Neodymium-147	100
Copper-64	100	Neodymium-149	100
Dysprosium-165	10	Nickel-59	100
Dysprosium-166	100	Nickel-63	10
Erbium-169	100	Nickel-65	100
Erbium-171	100	Niobium-93m	10
Europium-152 (9.2 h)	100	Niobium-95	10
Europium-152 (13 yr)	1	Niobium-97	10
Europium-154	1	Osmium-185	10
Europium-155	10	Osmium-191m	100
Fluorine-18	1,000	Osmium-191	100
Gadolinium-153	10	Osmium-193	100
Gadolinium-159	100	Palladium-103	100
Gallium-72	10	Palladium-109	100

\* To convert  $\mu\text{Ci}$  to kBq, multiply the  $\mu\text{Ci}$  value by 37.

**QUANTITIES FOR USE WITH DECOMMISSIONING**

<u>Material</u>	<u>Microcuri e*</u>	<u>Material</u>	<u>Microcurie *</u>
Phosphorus-32	10	Technetium-97m	100
Platinum-191	100	Technetium-97	100
Platinum-193m	100	Technetium-99m	100
Platinum-193	100	Technetium-99	10
Platinum-197m	100	Tellurium-125m	10
Platinum-197	100	Tellurium-127m	10
Plutonium-239	0.01	Tellurium-127	100
Polonium-210	0.1	Tellurium-129m	10
Potassium-42	10	Tellurium-129	100
Praseodymium-142	100	Tellurium-131m	10
Praseodymium-143	100	Tellurium-132	10
Promethium-147	10	Terbium-160	10
Promethium-149	10	Thallium-200	100
Radium-226	0.01	Thallium-201	100
Rhenium-186	100	Thallium-202	100
Rhenium-188	100	Thallium-204	10
Rhodium-103m	100	Thorium (natural)**	100
Rhodium-105	100	Thulium-170	10
Rubidium-86	10	Thulium-171	10
Rubidium-87	10	Tin-113	10
Ruthenium-97	100	Tin-125	10
Ruthenium-103	10	Tungsten-181	10
Ruthenium-105	10	Tungsten-185	10
Ruthenium-106	1	Tungsten-187	100
Samarium-153	100	Uranium (natural)***	100
Scandium-46	10	Uranium-233	0.01
Scandium-47	100	Uranium-234	0.01
Scandium-48	10	Uranium-235	0.01
Selenium-75	10	Vanadium-48	10
Silicon-31	100	Xenon-131m	1,000
Silver-105	10	Xenon-133	100
Silver-110m	1	Xenon-135	100
Silver-111	100	Ytterbium-175	100
Sodium-22	1	Yttrium-90	10
Sodium-24	10	Yttrium-91	10
Strontium-85	10	Yttrium-92	100
Strontium-89	1	Yttrium-93	100
Strontium-90	0.1	Zinc-65	10
Strontium-91	10	Zinc-69m	100
Strontium-92	10	Zinc-69	1,000
Sulfur -35	100	Zirconium-93	10
Tantalum-182	10	Zirconium-95	10
Technetium-96	10	Zirconium-97	10

\* To convert  $\mu\text{Ci}$  to kBq, multiply the  $\mu\text{Ci}$  value by 37.

\*\* Based on alpha disintegration rate of Th-232, Th-230 and their daughter products.

\*\*\* Based on alpha disintegration rate of U-238, U-234, and U-235.

## QUANTITIES FOR USE WITH DECOMMISSIONING

<u>Material</u>	<u>Microcurie*</u>
Any alpha emitting radionuclide not listed above or mixtures of alpha emitters of unknown composition	0.01
Any radionuclide other than alpha emitting radionuclides, not listed above or mixtures of beta emitters of unknown composition	0.1

\* To convert  $\mu\text{Ci}$  to  $\text{kBq}$ , multiply the  $\mu\text{Ci}$  value by 37.

**NOTE:** Where there is involved a combination of isotopes in known amounts, the limit for the combination should be derived as follows: Determine, for each isotope in the combination, the ratio between the quantity present in the combination and the limit otherwise established for the specific isotope when not in combination. The sum of such ratios for all the isotopes in the combination may not exceed "1" -- that is, unity.