

APPENDIX 16-A

TABLE 1

EXEMPTIONS

Table 1-A. Radioactive Materials

Item (a) Exempt concentrations.

- (1) Except as provided in paragraph (2) of this item, any person is exempt from the requirements of this Part to the extent that such person transfers, receives, possesses or uses products or materials containing radioactive material in concentrations not in excess of those listed in Table 2 of this Appendix.
- (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 paragraph (1) of this item or equivalent regulations of the United States Nuclear Regulatory Commission or any agreement State, except in accordance with specific license issued by the department or a similar license issued by the State Department of Labor, the New York City Department of Health, the United States Nuclear Regulatory Commission, any agreement State or the general license provided in item (h) of Table 6 of this Appendix.

Item (b) Exempt quantities.¹

- (1) Except as provided in paragraphs (2) and (3) of this item, any person is exempt from the requirements of this Part to the extent that such person transfers, receives, possesses or uses radioactive material in individual quantities each of which does not exceed the applicable quantity set forth in Table 3 of this Appendix.
- (2) Any person who possesses radioactive material received prior to July 1, 1973, under the exemption formerly provided in section 16.101 of this Part is exempt from the requirements of this Part to the extent that such person transfers, receives, possesses or uses such radioactive material.
- (3) No person may, for purposes of commercial distribution, transfer radioactive material in the individual quantities set forth in Table 3 of this Appendix, knowing or having reason to believe that such quantities of radioactive material will be transferred to persons exempt under paragraph (1) of this item or equivalent regulations of the State Department of Labor, the New York City Department of Health, the United States Nuclear Regulatory Commission or any agreement State, except in accordance with a specific license issued by the department or a similar license issued by the State Department of Labor, the New York City Department of Health, the United States Nuclear

¹ Authority to transfer possession or control by the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing byproduct material or source material whose subsequent possession, use, transfer, and disposal by all other persons are exempted from regulatory requirements may be obtained only from the United States Nuclear Regulatory Commission, Washington, D.C. 20555.

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TABLE 1 (continued)

Regulatory Commission or any agreement State pursuant to licensing requirements equivalent to this in section 32.18 of 10

CFR Part 32 of the regulations of the United States Nuclear Regulatory Commission which license states that the radioactive material may be transferred to persons exempt under paragraph (1) or the equivalent regulations of the United States Nuclear Regulatory Commission or any agreement State.

- (4) This subdivision 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.

Item (c) Certain items containing radioactive material. Except for person who apply radioactive material to, or persons who incorporated radioactive material into, the following products, any person is exempt from the requirements of this Part to the extent that he transfers, receives, possesses or uses the following products:

- (1) timepieces or timepiece hands or dials containing radium which were manufactured prior to July 1, 1973.
- (2) timepieces or timepiece hands or dials containing radium which were manufactured under a specific license issued by the department, the State Department of Labor or any agreement State and which meet the following or equivalent conditions:
- (i) timepieces or timepiece hands or dials containing not more than the following specified quantities of radium:
- (a) 0.15 microcurie per watch;
 - (b) 0.03 microcurie per watch hand;
 - (c) 0.09 microcurie per watch dial;
 - (d) 0.20 microcurie per clock;
 - (e) 0.04 microcurie per clock hand;
 - (f) 0.12 microcurie per clock dial.
- (ii) the timepiece is not a pocket watch;
- (iii) the timepiece is marked or coded to identify the date of manufacture and that it contains radium;
- (iv) the timepiece emits sufficient luminosity, omitting photoactivation, that its dial can be read in the dark during its entire design lifetime.
- (3) timepieces or timepiece hands or dial containing not more than the following specified quantities of radioactive material and not exceeding the following specified levels of radiation.
- (i) 25 millicuries of Hydrogen 3 per timepiece;

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TABLE 1 (continued)

- (ii) five millicuries of Hydrogen 3 per hand;
- (iii) 15 millicuries of Hydrogen 3 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 one centimeter from any surface;
 - (c) For any other timepiece, 0.2 millirad per hour at 10 centimeters from any surface.
- (4) Lock illuminators containing not more than 15 millicuries of Hydrogen 3 or not more than two millicuries of Promethium 147 installed in automobile locks. The levels of radiation from each lock illuminator containing Promethium 147 will exceed one millirad per hour at one centimeter from any surface when measured through 50 milligrams per square centimeter of absorber.
- (5) Balances of precision containing not more than one millicurie of Hydrogen 3 per balance or not more than 0.5 millicurie of Hydrogen 3 per balance part.
- (6) Automobile shift quadrants containing not more than 25 millicuries of Hydrogen 3.
- (7) Marine compasses containing not more than 750 millicuries of Hydrogen 3 gas and other marine navigational instruments containing not more than 250 millicuries of Hydrogen 3 gas.
- (8) Thermostat dials and pointers containing not more than 25 millicuries of Hydrogen 3 per thermostat.
- (9) Electron tubes, provided, that each tube does not contain more than one of the following specified quantities of radioactive material:
 - (i) 150 millicuries of Hydrogen 3 per microwave receiver protector tube or 10 millicuries of Hydrogen 3 per any other electron tube;
 - (ii) one microcurie of Cobalt 60;
 - (iii) five microcuries of Nickel 63;
 - (iv) 30 microcuries of Krypton 85;

TABLE 1 (continued)

(v) five microcuries of Cesium 137;

(vi) 30 microcuries of Promethium 147;

and provided further, that the level of radiation due to radioactive material contained in each electron tube does not exceed one millirad per hour at one centimeter from any surface when measured through seven milligrams per square centimeter of absorber.²

Item (d) Resins containing Scandium 46 and designed for sand consolidation in oil wells. Any person is exempt from the requirements of this Part to the extent that such person transfers, receives, possesses or uses 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 United States Nuclear Regulatory Commission, or shall have been manufactured in accordance with the specifications contained in a specific license issued by the department, the State Department of Labor, on 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 United States Nuclear Regulatory Commission. This exemption does not authorize the manufacture of any resins containing Scandium 46.

Item (e) Gas and aerosol detectors containing radioactive material. Except for persons who manufacture, process or produce gas and aerosol detectors containing radioactive material, any person is exempt from the requirements of this Part to the extent that such person transfers, receives, possesses or uses radioactive material in gas or 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 United States Nuclear Regulatory Commission,³ or shall have been manufactured or transferred in accordance with the specifications contained in a specific license issued by the department, the State Department of Labor, the New York City Department of Health, or any agreement State to the manufacturer of such gas and aerosol detectors pursuant to licensing requirements equivalent to those in section 32.26 of 10 CFR Part 32 which license authorizes the transfer of the detectors to persons who are exempt from regulatory requirements.

Item (f) Self-luminous products containing Hydrogen 3, Krypton 85, or Promethium 147. Except for persons who manufacture, process or produce self-luminous products containing Hydrogen 3, Krypton 85, or Promethium 147, any person is exempt from the requirements of this Part to the extent that such person transfer, receives, possesses or uses Hydrogen 3, Krypton 85, or Promethium 147 in self-luminous products manufactured, processed, produced, imported or transferred in accordance with a specific license issued by the United State Nuclear Regulatory Commission pursuant to section 32.22 of 10 CFR Part 32, which

² For purposes of this paragraph "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.

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

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TABLE 1 (continued)

license authorizes the transfer of the product to persons who are exempt from regulatory requirements. The exemption in this item does not apply to Hydrogen 3, Krypton 85, or Promethium 147 used in products for frivolous purposes or in toys or adornments.

Item (g) Any person is exempt from the requirements of this part to the extent that such person transfers, receives, possesses or uses source material in any chemical mixture, compound, solution or alloy in which the source material is by weight less than 1/20 of one percent (0.05 percent) of the mixture, compound, solution, or alloy.

Item (h) Any person is exempt from the requirements of this Part to the extent that such person transfers, receives, possesses, or uses 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.

Item (i) Any person is exempt from the requirements of this Part to the extent that such person transfers, receives, possesses or uses:

- (1) Any quantities of thorium contained in (i) incandescent gas mantles, (ii) vacuum tubes, (iii) welding rods, (iv) electric lamps for illuminating purposes provided that each lamp does not contain more than 50 milligrams of thorium, (v) germicidal lamps, sunlamps, and lamps for outdoor or industrial lighting provided that each lamp does not contain more than two grams of thorium, or (vi) 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 (vii) personnel neutron dosimeters, provided that each dosimeter does not contain more than 50 milligrams thorium.
- (2) Source material contained in the following products:
 - (i) glazed ceramic tableware, provided that the glaze contains not more than 20 percent by weight source material;
 - (ii) piezoelectric ceramic containing not more than two percent by weight source material;
 - (iii) 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, glass enamel or ceramic used in construction;
 - (iv) glass enamel or 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.
- (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 four percent by weight and that the exemption contained in this paragraph 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, or missiles, or stored or handled in connection with installation or removal of such counterweights; provided that:

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TABLE 1 (continued)

- (i) the counterweights are manufactured in accordance with specific license issued by the department, the New York State Department of Labor, the New York City Department of Health, the United States Nuclear Regulatory Commission or any agreement State authorizing distribution by the licensee pursuant to this subparagraph or equivalent regulations of the United States Nuclear Regulatory Commission or any agreement State;
 - (ii) each counterweight has been impressed with the following legend clearly legible through any plating or other covering: "DEPLETED URANIUM";
 - (iii) each counterweight is durably and legibly labeled or marked with the identification of the manufacturer and the statement: "UNAUTHORIZED ALTERATIONS PROHIBITED";⁴ and
 - (iv) the exemption contained in this paragraph 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:
- (i) The shipping container is conspicuously and legibly impressed with the legend "CAUTIONRADIOACTIVE SHIELDING-URANIUM;" and
 - (ii) The uranium is encased in mild steel or equally fire resistant metal of minimum wall thickness of one-eighth inch (3.2mm).
- (7) Thorium contained in finished optical lenses, provided that each lens does not contain more than 30 percent by weight of thorium; and that the exemption contained in this paragraph shall not be deemed to authorize either:
- (i) 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
 - (ii) the transfer, receipt, possession or use of thorium contained in contact lenses, or in spectacles, or in eyepieces in binoculars or other optical instruments.
- (8) Uranium contained in detector heads for use in fire detection units, provided that each detector head contains not more than 0.005 microcurie of uranium.
- (9) Thorium contained in any finished aircraft engine part containing nickel-thoria alloy, provided that:
- (i) the thorium is dispersed in the nickel-thoria alloy in the form of finely divided thoria (thorium dioxide); and

⁴ The requirements specified in subparagraph (ii) and (iii) of this paragraph need not be met by counterweights manufactured prior to December 31, 1969; provided, that such counterweights are impressed with the legend, "CAUTION-RADIOACTIVE MATERIAL-URANIUM", as previously required by this Part.

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TABLE 1 (continued)

(ii) the thorium content in the nickel-thoria alloy does not exceed four percent by weight.

The exemptions in this paragraph do not authorize the manufacturer of any of the products described.

- (10) Ionizing radiation measuring instruments containing, for purposes of internal calibration or standardization, one or more sources of radioactive material provided that:
- (i) each source contains no more than one exempt quantity set forth in Appendix 16-A, Table 3; and
 - (ii) each instrument contains no more than ten exempt quantities. For purposes of this requirement, an instrument's source(s) may contain either one type 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 Appendix 16-A, Table 3, provided that the sum of such fractions shall not exceed unity.
- (iii) For purposes of this paragraph (iii), 0.05 μCi Americium is considered an exempt quantity under Appendix 16-A, Table 3.
- (11) Spark gap irradiators containing more than 1 μCi of Cobalt 60 per spark gap irradiator for use in electrically ignited fuel oil burners having a firing rate of at least three gallons (11.4 liters) per hour.

NOTE: The exemptions in Item (i) do not authorize the manufacture of any of the products described.

Table 1-B. Radiation Equipment

Item (a) Radiation equipment constructed so that it cannot emit radiation at a level greater than 0.5 milliroentgen per hour, measured two inches or five centimeters from the surface, and averaged over an area of 1.55 square inches or 10 square centimeters is exempt from the requirements of this Part; provided, however, that such exemption shall not apply to the testing or servicing of such equipment during its production.

Item (b) Radiation equipment during its storage, shipment, retail sale or other similar use during which such equipment is not connected to a voltage source and does not emit radiation is exempt from the requirements of this Part.

APPENDIX 16-A
TABLE 2
EXEMPT CONCENTRATIONS

Element (atomic number)	Radionuclide	Column I	Column II
		Gas concentration ($\mu\text{C}/\text{ml}^3$)	Liquid and solid concentration ($\mu\text{C}/\text{ml}^6$)
Antimony (51)	Sb 122	.....	3E-4
	Sb 124	.....	2E-4
	Sb 125	.....	1E-3
Argon (18)	A 37	1E-8	.....
	A 41	4E-7	.....
Arsenic (33)	As 73	.....	5E-3
	As 74	.....	5E-4
	As 76	.....	2E-4
	As 77	.....	8E-4
Barium (56)	Ba 131	.....	2E-3
	Ba 140	.....	3E-4
Beryllium (4)	Be 7	.....	2E-2
Bismuth (83)	Bi 206	.....	4E-4
Bromine (35)	Br 82	4E-7	3E-3
Cadmium (48)	Cd 109	.....	2E-3
	Cd 115m	.....	3E-4
	Cd 115	.....	3E-4
Calcium (20)	Ca 45	.....	9E-5
	Ca 47	.....	5E-4
Carbon (6)	C 14	1E-6	8E-3
Cerium (58)	Ce 141	.....	9E-4
	Ce 143	.....	4E-4
	Ce 144	.....	1E-4
Cesium (55)	Cs 131	.....	2E-2
	Cs 134m	.....	6E-2
	Cs 134	.....	9E-5
Chlorine (17)	Cl 38	9E-7	4E-3
Chromium (24)	Cr 51	.....	2E-2
Cobalt (27)	Co 57	.....	5E-3
	Co 58	.....	1E-3
	Co 60	.....	5E-4
Copper (29)	Cu 64	.....	3E-3
Dysprosium (66)	Dy 165	.....	4E-3
	Dy 166	.....	4E-4
Erbium (68)	Er 169	.....	9E-4
	Er 171	.....	1E-3
Europium (63)	Eu 152	.....	6E-4
	(T/2=9.2Hrs.	.....	2E-3
Fluorine (9)	F 18	2E-6	8E-3
Gadolinium (64)	Gd 153	2E-3
	Gd 159	8E-4
Gallium (31)	Ga 72	4E-4

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TABLE 2 (Continued)
EXEMPT CONCENTRATIONS

Element (atomic number)	Radionuclide	Column I	Column II
		Gas concentration ($\mu\text{C}/\text{ml}^3$)	Liquid and solid concentration ($\mu\text{C}/\text{ml}^6$)
Germanium(32)	Ge 71	.....	2E-2
Gold (79)	Au 196	.....	2E-3
	Au 198	.....	5E-4
	Au 199	.....	2E-3
	Hafnium (72)	Hf 181	.....	7E-4
Hydrogen (1)	H 3	5E-6	3E-2
Indium (49)	In 113m	.....	1E-2
	In 114m	.....	2E-4
Iodine (53)	I 126	3E-9	2E-5
	I 131	3E-9	2E-5
	I 132	8E-8	6E-4
	I 133	1E-8	7E-5
	I 134	2E-7	1E-3
Iridium (77)	Ir 190	.....	2E-3
	Ir 192	.....	4E-4
	Ir 194	.....	3E-4
Iron (26)	Fe 55	.....	8E-3
	Fe 59	.....	6E-4
Krypton (36)	Kr 85m	1E-6	.....
	Kr 85	3E-6	.....
Lanthanum (57)	La 140	.....	2E-4
Lead (82)	Pb 203	.....	4E-3
Lutetium (71)	Lu 177	.....	1E-3
Manganese (25)	Mn 52	.....	3E-4
	Mn 54	.....	1E-3
	Mn 56	.....	1E-3
Mercury (80)	Hg 197m	.....	2E-3
	Hg 197	.....	3E-3
	Hg 203	.....	2E-4
Molybdenum (42)	Mo 99	.....	2E-3
Neodymium (60)	Nd 147	.....	6E-4
	Nd 149	.....	3E-3
Nickel (28)	Ni 65	.....	1E-3
Niobium (Columbium)	Nb 95	1E-3
	Nb 97	9E-3
Osmium (76)	Os 185	7E-4
	Os 191m	3E-2
	Os 191	2E-3

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TABLE 2 (Continued)
EXEMPT CONCENTRATIONS

Element (atomic number)	Radionuclide	Column I	Column II
		Gas concentration ($\mu\text{C}/\text{ml}^5$)	Liquid and solid concentration ($\mu\text{C}/\text{ml}^6$)
Palladium (46)	Os 193	.....	6E-4
	Pd 103	.....	3E-3
	Pd 109	.....	9E-4
Phosphorus (15)	P 32	.....	2E-4
Platinum (78)	Pt 191	.....	1E-3
	Pt 193m	.....	1E-2
	Pt 197m	.....	1E-2
	Pt 197	.....	1E-3
Polonium (84)	Po 210	2E-10	7E-6
Potassium (19)	K 42	.....	3E-3
Praseodymium (59)	Pr 142	.....	3E-4
	Pr 143	.....	5E-4
Promethium (61)	Pm 147	.....	2E-3
	Pm 149	.....	4E-4
Radium (88)	Ra 226	1E-11	1E-7
	Ra 228	2E-11	3E-7
Rhenium (75)	Re 183	.....	6E-3
	Re 186	.....	9E-4
	Re 188	.....	6E-4
Rhodium (45)	Rh 103m	.....	1E-1
	Rh 105	.....	1E-3
Rubidium (37)	Rb 86	.....	7E-4
Ruthenium (44)	Ru 97	.....	4E-3
	Ru 103	.....	8E-4
	Ru 105	.....	1E-3
	Sc 48	.....	3E-4
Selenium (34)	Se 75	.....	3E-3
Silicon (14)	Si 31	.....	9E-3
Silver (47)	Ag 105	.....	1E-3
	Ag 110m	.....	3E-4
	Ag 111	.....	4E-4
	Ru 106	.....	1E-4
Samarium (62)	Sm 153	.....	8E-4
Scandium (21)	Sc 46	4E-4
	Sc 47	9E-4
Sodium (11)	Na 24	2E-3
Strontium (38)	Sr 85	1E-3
	Sr 89	1E-4

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TABLE 2 (Continued)
EXEMPT CONCENTRATIONS

Element (atomic number)	Radionuclide	Column I	Column II
		Gas concentration ($\mu\text{C}/\text{ml}^{\text{S}}$)	Liquid and solid concentration ($\mu\text{C}/\text{ml}^{\text{S}}$)
	Sr 91	.....	7E-4
	Sr 92	.....	7E-4
Sulfur (16)	S 35	9E-8	6E-4
Tantalum (73)	Ta 182	.....	4E-4
Technetium (43)	Tc 96m	.....	1E-1
	Tc 96	.....	1E-3
Tellurium (52)	Te 125m	.....	2E-3
	Te 127m	.....	6E-4
	Te 127	.....	3E-3
	Te 129m	.....	3E-4
	Te 131m	.....	6E-4
	Te 132	.....	3E-4
Terbium (65)	Tb 160	.....	4E-4
Thallium (81)	Tl 200	.....	4E-3
	Tl 201	.....	3E-3
	Tl 202	.....	1E-3
	Tl 204	.....	1E-3
Thulium (69)	Tm 170	.....	5E-4
	Tm 171	.....	5E-3
Tin (50)	Sn 113	.....	9E-4
	Sn 125	.....	2E-4
Tungsten (Wolfram) (74)	W 181	.....	4E-3
	W 187	.....	7E-4
Vanadium (23)	V 48	.....	3E-4
Xenon (54)	Xe 131m	4E-6	.....
	Xe 133	3E-6	.....
	Xe 135	1E-6	.....
Ytterbium (70)	Yb 175	.....	1E-3
Yttrium (39)	Y 90	.....	2E-4
	Y 91m	.....	3E-2
	Y 91	.....	3E-4
	Y92	6E-4
	Y 93	3E-4
Zinc (30)	Zn 65	1E-3
	Zn 69m	7E-4
	Zn 69	2E-2
Zirconium (40)	Zr 95	6E-4
	Zr 97	2E-4

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TABLE 2 (Continued)
EXEMPT CONCENTRATIONS

Element (atomic number)	Radionuclide	Column I	Column II
		Gas concentration ($\mu\text{C}/\text{ml}^5$)	Liquid and solid concentration ($\mu\text{C}/\text{ml}^6$)
Beta and/or gamma emitting radioactive material not listed above with half-life less than 3 years.		1E-10	1E-6
		1E-12	1E-8
Alpha emitting radioactive material (other than special nuclear material) not listed above.			

Note 1: Many radionuclides disintegrate into daughter products which are also radioactive. In expressing the concentrations in Table 2 the activity stated is that of the parent radionuclide and takes into account the radioactive daughter products.

Note 2: For purposes of Table 1, subdivision (a), where there is present a combination of radionuclides, the limit for the combination shall be derived as follows: Determine for each radionuclide present the ratio between the concentration of the radionuclide in the combination and the exempt concentration listed in Table 2. The sum of such ratios shall not exceed unity.

Example:

$$\frac{\text{Concentration of Radionuclide A in Combination}}{\text{Exempt concentration of Radionuclide A}} + \frac{\text{Concentration of Radionuclide B in Combination}}{\text{Exempt concentration of Radionuclide B}} \leq 1$$

⁵ Values are given only for those radionuclides normally used as gases.

⁶ $\mu\text{c}/\text{gm}$ for solids.

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TABLE 3
EXEMPT QUANTITIES

Radionuclide	Exempt quantity (microcuries)	Radionuclide	Exempt quantity (microcuries)
Antimony 122 (Sb 122)	100		
Antimony 124 (Sb 124)	10	Erbium 169 (Er 169)	100
Antimony 125 (Sb 125)	10	Erbium 171 (Er 171)	100
Arsenic 73 (As 73)	100	Europium 152 (Eu 152) 9.2h	100
Arsenic 74 (As 74)	10	Europium 152 (Eu 152) 13yr	1
Arsenic 76 (As 76)	10	Europium 154 (Eu 154)	1
Arsenic 77 (As 77)	100	Europium 155 (Eu 155)	10
Barium 131 (Ba 131)	10	Flourine 18 (F 18)	1,000
Barium 133 (Ba 133)	10		
Barium 140 (Ba 140)	10	Gadolinium 153	10
Beryllium (Be 7)	100	Gadolinium 159 (Gd 159)	1100
Bismuth 210 (Bi 210)	1	Gallium 72 (Ga 72)	10
Bromine 82 (Br 82)	10	Germanium 71 (Ge 71)	100
		Gold 198 (Au 198)	100
Cadmium 109 (Cd 109)	10	Gold 199 (Au 199)	100
Cadmium 115m (Cd 115m)	10		
Cadmium 115 (Cd 115)	100	Hafnium 181 (Hf 181)	10
Calcium 45 (Ca 45)	10	Holmium 166 (Ho 166)	100
Calcium 47 (Ca 47)	10	Hydrogen 3 (H 3)	1,000
Carbon 14 (C 14)	100		
Cerium 141 (Ce 141)	100	Indium 113m (In 113m)	100
Cerium 143 (Ce 143)	100	Indium 114m (In 114m)	10
Cerium 144 (Ce 144)	1	Indium 114 (In 114)	1
Cesium 131 (Cs 131)	1,000	Indium 115m (In 115m)	100
Cesium 134m (Cs 134m)	100	Indium 115 (In 115)	10
Cesium 134 (Cs 134)	1	Iodine 125 (I 125)	1
Cesium 135 (Cs 135)	10	Iodine 126 (I 126)	1
Cesium 136 (Cs 136)	10	Iodine 129 (I 129)	0.1
Cesium 137 (Cs 137)	10	Iodine 131 (I 131)	1
Chlorine 36 (Cl 36)	10	Iodine 132 (I 132)	10
Chlorine 38 (Cl 38)	10	Iodine 133 (I 133)	1
Chromium 51 (Cr 51)	1,000	Iodine 134 (I 134)	10
Cobalt 58m (Co 58m)	10	Iodine 135 (I 135)	10
Cobalt 58 (Co 58)	10	Iridium 192 (Ir 192)	10
Cobalt 60 (Co 60)	1	Iridium 194 (Ir 194)	100
Copper 64 (Cu 64)	100	Iron 55 (Fe 55)	100
		Iron 59 (Fe 59)	10
Dysprosium 165 (Dy 165)	10		
Dysprosium 166 (Dy 166)	100	Krypton 85 (Kr 85)	100

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TABLE 3
EXEMPT QUANTITIES

Radionuclide	Exempt quantity (microcuries)	Radionuclide	Exempt quantity (microcuries)
Krypton 87 (Kr 87)	10	Promethium 149 (Pm 149)	10
Lanthanum 140 (La 140)	10	Radium 226 (Ra 266)	0.1
Lutetium 177 (Lu 177)	100	Rhenium 186 (Re 186)	100
		Rhenium 188 (Re 188)	100
Manganese 52 (Mn 52)	10	Rhodium 103m (Re 103m)	100
Manganese 54 (Mn 54)	10	Rhodium 105 (Rh 105)	100
Manganese 56 (Mn 56)	10	Rubidium 86 (Rb 86)	10
Mercury 197m (Hg 197m)	100	Rubidium 87 (Ru 87)	10
Mercury 197 (Hg 197)	100	Ruthenium 97 (Ru 97)	100
Mercury 203 (Hg 203)	10	Ruthenium 103 (Ru 103)	10
Molybdenum 99 (Mo 99)	100	Ruthenium 105 (Ru 105)	10
		Ruthenium 106 (Ru 106)	1
Neodymium 147 (Nd 147)	100		
Neodymium 149 (Nd 149)	100	Samarium 151 (Sm 151)	10
Nickel 59 (Ni 59)	100	Samarium 153 (Sm 153)	100
Nickel 63 (Ni 63)	10	Scandium 46 (Sc 46)	10
Nickel 65 (Ni 65)	100	Scandium 47 (Sc 47)	100
Niobium 93m (Nb 93m)	10	Scandium 48 (Sc 48)	10
Niobium 95 (Nb 95)	10	Selenium 75 (Se 75)	10
Niobium 97 (Nb 97)	10	Silicon 31 (Si 31)	100
		Silver 105 (Ag 105)	10
Osmium 185 (Os 185)	10	Silver 110m (Ag 110m)	1
Osmium 191m (Os 191m)	100	Silver 111 (Ag 111)	100
Osmium 191 (Os 191)	100	Sodium 22 (Na 22)	10
Osmium 193 (Os 193)	100	Sodium 24 (Na 24)	10
		Strontium 85 (Sr 85)	10
Palladium 103 (Pd 103)	100	Strontium 89 (Sr 89)	1
Palladium 109 (Pd 109)	100	Strontium 90 (Sr 90)	0.1
Phosphorus 32 (P 32)	10	Strontium 91 (Sr 91)	10
Platinum 191 (Pt 191)	100	Strontium 92 (Sr 92)	10
Platinum 193m (Pt 193m)	100	Sulphur 35 (S 35)	100
Platinum 193 (Pt 193)	100		
Platinum 197m (Pt 197m)	100	Tantalum 182 (Ta 182)	10
Platinum 197 (Pt 197)	100	Technetium 96 (Tc 96)	10
Polonium 210 (Po 210)	0.1	Technetium 97m (Tc 97m)	100
Potassium 42 (K 42)	10	Technetium 97 (Tc 97)	100
Praseodymium 142 (Pr 142)	100	Technetium 99m (Tc 99m)	100
Praseodymium 143 (Pr 143)	100	Technetium 99 (Tc 99)	10
Promethium 147 (Pm 147)	10	Tellurium 125m (Te 125m)	10

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TABLE 3
EXEMPT QUANTITIES

Radionuclide	Exempt quantity (microcuries)	Radionuclide	Exempt quantity (microcuries)
Tellurium 127m (Te 127m)	10	Xenon 133 (Xe 133)	100
Tellurium 127 (Te 127)	100	Xenon 135 (Xe 135)	100
Tellurium 129m (Te 129m)	10		
Tellurium 129 (Te 129)	100	Ytterbium 175 (Yb 175)	100
Tellurium 131m (Te 131m)	10	Yttrium 90 (Y 90)	10
Tellurium 132 (Te 132)	10	Yttrium 91 (Y 91)	10
Terbium 160 (Tb 160)	10	Yttrium 92 (Y 92)	100
Thallium 200 (Tl 200)	100	Yttrium 93 (Y 93)	100
Thallium 201 (Tl 201)	100		
Thallium 202 (Tl 202)	100	Zinc 65 (Zn 65)	10
Thallium 204 (Tl 204)	10	Zinc 69 (Zn 69)	1,000
Thulium 170 (Tm 170)	10	Zinc 69m (Zn 69m)	100
Thulium 171 (Tm 171)	10	Zirconium 93 (Zr 93)	10
Tin 113 (Sn 113)	10	Zirconium 95 (Zr 95)	10
Tin 125 (Sn 125)	10	Zirconium 97 (Zr 97)	10
Tungsten 181 (W 181)	10		
Tungsten 185 (W 185)	10		
Tungsten 187 (W 187)	100	Radioactive material other than alpha emitting radioactive materia lnot listed above	0.1
Vanadium 48 (V 48)	10		
Xenon 131m (Xe 131m)	1,000		

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TABLE 4
(reserved)

TABLE 5
(reserved)

APPENDIX 16-A

TABLE 6

GENERAL LICENSES⁷

Item (a) Certain devices and equipment.

(1) A general license is hereby issued to transfer, receive, possess or use radioactive material incorporated in the following devices or equipment which have been manufactured, tested and labeled in accordance with a specific license issued by the department, the State Department of Labor, the New York City Department of Health, the United States Nuclear Regulatory Commission or any agreement State, and authorizing distribution under the general license of this paragraph or its equivalent.

- (i) Static elimination devices. 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.
- (ii) Ion generating tubes. 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 per device.

Item (b) Certain measuring, gauging or controlling devices.

(1) A general license is hereby issued to receive, possess or use radioactive material when 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, when such devices are manufactured or imported in accordance with the specifications contained in a specific license issued to the supplier by the department, the State Department of Labor, the New York City Department of Health, the United States Nuclear Regulatory Commission or any agreement State, and authorizing distribution under the general license of this paragraph or its equivalent; provided, that:

- (i) such devices are labeled in accordance with the provisions of the specific license which authorizes the distribution of the devices;⁸
- (ii) such devices bear a label containing the following or a substantially similar statement which contains the information called for in the following statement:

⁷ Radioactive material possessed or used under a general license is subject to the requirements of sections 16.6 through 16.17 under the heading "General Provisions" of this Part.

⁸ 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 121.3001 of the Code of Federal Regulations, Title 21.

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TABLE 6 (continued)

The transfer, receipt, possession or use of this device, Model⁹ _____, Serial No.⁹ _____, are subject to a general license or the equivalent and the regulations of the United States Nuclear Regulatory Commission or of a State with which the Nuclear Regulatory Commission has entered into an agreement for the exercise of regulatory authority. Removal of this label is prohibited.

CAUTION — RADIOACTIVE MATERIAL

(Name of supplier)⁹

- (iii) such devices are installed on the premises of the general licensee by a person authorized to install such devices under a specific license issued to the installer by the department, the State Department of Labor, the New York City Department of Health, the United States Nuclear Regulatory Commission or any agreement State, if a label affixed to the device at the time of receipt states that installation by a specific licensee is required. The requirement of this subparagraph does not apply while devices are held in storage in the original shipping container pending installation by a specific licensee.
- (2) Persons who receive, possess or use a device pursuant to the general license contained in paragraph (1) of this item:
- (i) shall within 10 days after the receipt of the device notify the department of the type of device and the name and address of the supplier;
 - (ii) shall not transfer, abandon, or dispose of the device except by transfer to a person duly authorized to receive such device by a specific license issued by the department, the State Department of Labor, the New York City Department of Health, the United States Nuclear Regulatory Commission or any agreement State, and shall furnish to the department, within 30 days after any transfer, a report containing the name of the manufacturer of the device, the type of device, the manufacturer's serial number of the device, and the name and address of the person receiving the device;
 - (iii) shall assure that all labels affixed to the device at the time of receipt and bearing the statement, "Removal of this label is prohibited" are maintained thereon and shall comply with all instructions contained in such labels;
 - (iv) shall have the device tested for leakage of radioactive material and proper operation of the on-off mechanism and indicator, if any, at the time of installation of the device or replacement of the radioactive material on the premises of the general licensee and thereafter at no longer than six-month intervals or at such longer intervals not to exceed three years as are specified in the label required by subparagraph (i) of paragraph (1) of this item, provided, that devices containing only Krypton 85 need not be tested for leakage, and devices containing only Hydrogen 3 need not be tested for any purpose;

⁹ The model, serial number, and name of supplier may be omitted from this label provided they are elsewhere specified in labeling affixed to the device.

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TABLE 6 (continued)

- (v) shall have the tests required by subparagraph (iv) of this paragraph and all other services involving the radioactive material, its shielding and containment, performed by the supplier or other person duly authorized by a specific license issued by the department, the State Department of Labor, the New York City Department of Health, the United States Nuclear Regulatory Commission or any agreement State, to manufacture, install, or service such devices;
- (vi) shall, within 30 days after the occurrence of a 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 of removable radioactive material, furnish to the department a report containing the name of the manufacturer of the device, the type of device, the manufacturer's serial number of the device and a brief description of the event and the remedial action taken; and shall maintain records of all tests performed on the devices as required under this item, including the dates and results of the tests and the names of the persons conducting the tests;
- (vii) shall, upon the occurrence of a failure of or damage to, or any indication of a possible failure of or damage to, the shielding or containment of the radioactive material or the on-off mechanism or indicator, immediately suspend operation of the device until it has been repaired by a person holding a specific license issued by the department, the State Department of Labor, the New York City Department of Health, the United States Nuclear Regulatory Commission or any agreement State, to manufacture, install, or service such devices, or disposed of by transfer to a person holding a specific license issued by the department, the State Department of Labor, the New York City Department of Health, the United States Nuclear Regulatory Commission or any agreement State to receive the radioactive material contained in the device;
- (viii) shall, be exempt from the requirements of sections 16.6 through 16.17 of this Part except that such persons shall comply with the provisions of paragraph (1) of subdivision (a) of section 16.15.

Item (c) Luminous safety devices for aircraft.

- (1) A general license is hereby issued to receive, possess or use Hydrogen 3 or Promethium 147 contained in luminous safety devices for use in aircraft, provided:
 - (i) each device contains not more than 10 curies of Hydrogen 3 or 300 millicuries of Promethium 147; and
 - (ii) each device has been manufactured, assembled or imported in accordance with a specific license issued by the United States Nuclear Regulatory Commission, or each device has been manufactured, assembled or imported in accordance with the specifications contained in a specific license issued by the department, the New York State Department of Labor, the New York City Department of Health, or any agreement State pursuant to licensing requirements equivalent to those in section 32.53 of 10 CFR Part 32 of the regulations of the United States Nuclear Regulatory Commission.

APPENDIX 16-A

TABLE 6 (continued)

(2) Persons who receive, possess or use luminous safety devices pursuant to the general license in paragraph (1) of this item are exempt from the requirements of section 16.6 through 16.17 of this Part except that they shall comply the provisions of paragraph (1) of subdivision (a) of section 16.15.

(3) This general license does not authorize the manufacture, assembly or repair of luminous safety devices containing Hydrogen 3 or Promethium 147.

(4) This general license does not authorize the receipt, possession or use of Promethium 147 contained in instrument dials.

Item (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.

Item (e) Calibration and reference sources.

(1) A general license is hereby issued to those persons listed below to transfer, receive, possess or use, in accordance with the provisions of paragraphs (3) and (4) of this item, Americium 241 in the form of calibration or reference sources:

- (i) any person who holds a specific license issued by the department, the State Department of Labor or the New York City Department of Health, which authorizes him to transfer, receive, possess or use radioactive material; and
- (ii) any person who holds a specific license issued by the United States Nuclear Regulatory Commission which authorizes him to transfer, receive, possess or use, special nuclear material.

(2) A general license is hereby issued to transfer, receive, possess or use plutonium in the form of calibration or reference sources in accordance with the provisions of paragraphs (4) and (5) of this item to any person who holds a specific license issued by the department, the State Department of Labor or the New York City Department of Health, which authorizes him to transfer, receive, possess or use radioactive material.

(3) The general licenses in paragraphs (1) and (2) of this item 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 United States 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 or imported in accordance with the specifications contained in a specific license issued by the department, the State Department of Labor, the New York City Department of Health, or any agreement 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 United States Nuclear Regulatory Commission.

(4) Persons who transfer, receive, possess or use one or more calibration or reference sources pursuant to these general licenses:

- (i) shall not possess at any one time, at any one location of storage or use, more than five microcuries of Americium 241 and five microcuries of Plutonium in such sources;

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TABLE 6 (continued)

- (ii) shall not transfer, receive, possess or use such source unless the source, or the storage container, bears a label which includes the following statement or a substantially similar statement which contains the information called for in the following statement:

The transfer, receipt, possession or use of this source Model _____, Serial No. _____, are subject to a general license and the regulations of the United States 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).¹⁰ DO NOT TOUCH RADIOACTIVE PORTION OF THIS SOURCE.

(Name of manufacturer or importer);

- (iii) shall not transfer, abandon, or dispose of such source except by transfer to a person authorized by a license from the department, the State Department of Labor, the New York City Department of Health, the United States Nuclear Regulatory Commission or an agreement State to receive the source;
- (iv) shall store such source, except when the source is being used, in a closed container adequately designed and constructed to contain Americium 241 or Plutonium which might otherwise escape during storage; and,
- (v) shall not use such source for any purpose other than the calibration of radiation detectors or the standardization of other sources.
- (5) These general licenses do not authorize the manufacture of calibration or reference sources containing Americium 241 or Plutonium.
- (6) A general license is hereby issued to transfer, receive, possess or use sealed radioactive materials sources in individual quantities each of which does not exceed the applicable quantity set forth in Table 3 of this Appendix, to any person who holds a specific license issued by the department.
- (7) Notwithstanding paragraph (6) of this item, a general license is hereby issued to transfer, receive, possess or use up to 10 individual sealed sources containing up to 20 microcuries of Radium 226 each to any person who holds a specific license issued by the department.
- (8) Persons who transfer, receive, possess or use sources pursuant to paragraphs (6) and/or (7) of this item:
- (i) shall not transfer, abandon, or dispose of such sources except by transfer to a person duly authorized to receive such sources by the department, the State Department of Labor, the New York City Department of Health, the United States Nuclear Regulatory Commission or any agreement State;

¹⁰ Showing only the name of the appropriate material.

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TABLE 6 (continued)

- (ii) shall store such sources, except when being used, in a secure location.

Item (f) Ice detection devices.

(1) A general license is hereby issued to transfer, receive, possess or use 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 United States Nuclear Regulatory Commission or each device has been manufactured or imported in accordance with the specifications contained in a specific license issued by the department, the State Department of Labor, the New York City Department of Health or any agreement State pursuant to licensing requirements equivalent to those in section 32.61 of 10 CFR Part 32 of the regulations of the United States Nuclear Regulatory Commission.

(2) Persons who transfer, receive, possess or use Strontium 90 contained in ice detection devices pursuant to the general license in paragraph (1) of this item:

- (i) 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 United States Nuclear Regulatory Commission or an agreement State to manufacture or service such devices; or shall dispose of the device pursuant to the provisions of section 16.8 of this Part.
- (ii) 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
- (iii) are exempt from the requirements of section 16.6 through 16.17 of this Part except that such persons shall comply with the provisions of section 16.8 and paragraph (1) of subdivision (a) of section 16.15.

(3) This general license does not authorize the manufacture, assembly, disassembly or repair of Strontium 90 in ice detection devices.

Item (g) Source material.

(1) A general license is hereby issued authorizing use and transfer of not more than 15 pounds of source material at any one time by persons in the following categories:

- (i) pharmacists using the source material solely for the compounding of medicinals;
- (ii) physicians using the source material for medicinal purposes;
- (iii) persons receiving possession of source material from pharmacists and physicians in the form of medicinals or drugs;
- (iv) commercial and industrial firms, and research, educational, and medical institutions for research, development, educational, or commercial purposes;

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TABLE 6 (continued)

and provided, that no such person shall, pursuant to this general license, receive more than a total of 150 pounds of source material in any one calendar year.

(2) Persons who transfer, receive, possess or use source material pursuant to the general license issued in paragraph (1) of this item are exempt from the provisions of sections 16.6 through 16.17 of this Part to the extent that such transfer, receipt, possession or use 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.

(3) A general license is hereby issued authorizing the receipt of title to source material without regard to quantity. The general license under this paragraph does not authorize any person to transfer, receive, possess or use source material.

Item (h) Validity of licenses issued by other agencies.

(1) A general license is hereby issued to the holder of a license issued by the State Department of Labor, New York City Department of Health, United States Nuclear Regulatory Commission or any agreement State to bring, possess or use radioactive material covered by such license within the department's jurisdiction for a period not in excess of 180 days in any 12 consecutive months, except as otherwise permitted in paragraph (2) of this item, provided that:

- (i) such license does not limit the holder's possession or use of such material to a specific installation or installations;
- (ii) such holder, at least three days prior to bringing such material within the department's jurisdiction, files with the department a notice indicating the period, type and location of proposed possession and use within the department's jurisdiction, and a copy of the license. At the discretion of the department, oral notification to the department may be accepted in lieu of the filing requirement;
- (iii) such holder supplies such additional information as the department may request;
- (iv) such holder, during the period of his possession and use of such material within the department's jurisdiction, complies with all applicable sections in this Part except section 16.100;
- (v) such holder, during such period, complies with all the terms and conditions of his license or permit, except such terms or conditions which may be inconsistent with the sections in this Part; and
- (vi) such holder shall not transfer, abandon, or dispose of the radioactive material possessed or used under this general license except by transfer to a person:
 - (a) who holds a valid license issued by the department, the State Department of Labor, the United States Nuclear Regulatory Commission or any agreement State to receive such radioactive material; or

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TABLE 6 (continued)

- (b) who is exempt from the requirements for a license for such material pursuant to the provision of Appendix 1, Table 1, item (a).

(2) Any holder of a license issued by the State Department of Labor, the New York City Department of Health, the United States Nuclear Regulatory Commission or an agreement State which authorizes the holder to manufacture, install or service a device described in Appendix 1, Table 6, item (b), paragraph (1), and which is not limited as to specific installation or installations may install or service such devices without obtaining a license from the department provided that:

- (i) such person shall file a report with the department within 30 days after the end of each calendar quarter in which any device is transferred to or installed within the department's jurisdiction. Each such report shall identify the name and address of each person receiving a device, the type of device transferred, and the quantity and type of radioactive material contained in the device;
- (ii) the device is manufactured, labeled, installed and serviced in accordance with terms and conditions of the license issued to such person;
- (iii) such person shall assure that any labels required to be affixed to the device bear a statement that "Removal of this label is prohibited"; and
- (iv) the person to whom he transfers such device or on whose premises he services or installs such a device has a copy of the general license requirements or equivalent requirements outlined under Appendix 1, Table 6, item (b), paragraph (2).

The department may withdraw, limit, or qualify its acceptance of any specific license 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.

Item (i) "In vitro" clinical or laboratory testing.¹¹

(1) A general license is hereby issued to any physician, clinical laboratory or hospital to transfer, receive, possess or use, for any of the following stated tests, in accordance with the provisions of paragraphs (2) through (5) of this item, the following radioactive materials in prepackaged units:

- (i) Iodine 125, Iodine 131, Carbon 14, Selenium 75 or Cobalt 57 in units not exceeding 10 microcuries each 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.
- (ii) Iron 59 in units not exceeding 20 microcuries each 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.

¹¹ The new drug provisions of the Federal Food, Drug and Cosmetic Act also govern the availability and use of any specific diagnostic drugs in interstate commerce.

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TABLE 6 (continued)

- (iii) Hydrogen 3 in units not exceeding 50 microcuries each 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.

(2) No person shall transfer, receive, possess or use radioactive material pursuant to the general license established by paragraph (1) of this item until he has filed Form GEN 373, "Registration Certificate — In Vitro Testing with Radioactive Materials Under General License", with the State Department of Health and received from such department a validated copy of Form GEN 373 with registration certificate number assigned. The physician, clinical laboratory or hospital shall furnish on Form GEN 373 the following information and such other information as may be required by such form:

- (i) name and address of the physician, clinical laboratory or hospital;
- (ii) the location of use;
- (iii) a statement that the applicant or the applicant's representative, if he is a laboratory director¹² or assists the laboratory director, holds an effective Certificate of Qualification as such to perform in vitro radionuclide procedures issued by the Clinical Laboratory Center, Division of Laboratories and Research, New York State Department of Health; and
- (iv) a statement that the physician, clinical laboratory or hospital has appropriate radiation measuring instruments to carry out in vitro clinical or laboratory tests with radioactive materials as authorized under the general license in paragraph (1) of this item and that such tests will be performed only by personnel competent in the use of such instruments and in the handling of the radioactive materials.

(3) A person who receives, possesses or uses radioactive material pursuant to the general license established by paragraph (1) of this item shall comply with the following:

- (i) the general licensee shall not possess at any one time, pursuant to the general license in paragraph (1) of this item, at any one location of storage or use more than:
 - (a) 200 microcuries of Iodine 125, Iodine 131, Iron 59, Selenium 75 and/or Cobalt 57;
 - (b) 100 microcuries of Carbon 14; or
 - (c) 1000 microcuries of Hydrogen 3.
- (ii) the general licensee shall store the radioactive material, until used, in the original shipping container or in a container providing equivalent radiation protection;
- (iii) the general licensee shall use the radioactive material only for the uses authorized by paragraph (1) of this item;

¹² The term laboratory director means a person responsible for administration of the technical and scientific operation of a clinical laboratory or blood bank, including supervision of procedures and reporting of findings of tests.

APPENDIX 16-A

TABLE 6 (continued)

- (iv) the general licensee shall neither transfer the radioactive material to a person who is not authorized to receive it pursuant to a license issued by the State Department of Health, the State Department of Labor, the New York City Department of Health, the United States Nuclear Regulatory Commission or any agreement State, nor transfer the radioactive material in any manner other than in the unopened, labeled shipping container as received from the supplier.
- (4) The general licensee shall not receive, possess or use radioactive material pursuant to paragraph (1) of this item:
- (i) except as prepackaged units which are labeled in accordance with the provisions of a specific license issued by the United States Nuclear Regulatory Commission pursuant to 10 CFR 32.71 or which are labeled in accordance with the provisions of a specific license issued by the State Department of Health, the State Department of Labor, the New York City Department of Health or any agreement State pursuant to licensing requirements equivalent to those contained in 10 CFR 32.71 which authorizes the manufacture of Iodine 125, Iodine 131, Iron 59, Carbon 14, Hydrogen 3, Selenium 75 or Cobalt 57 for distribution to persons generally licensed under paragraph (1) of this item or its equivalent; and
 - (ii) unless the following statement or a statement substantially similar thereto containing the information called for in the following statement appears on a label affixed to each prepackaged unit or appears in a leaflet or brochure which accompanies the package:

This radioactive material may be received, acquired, possessed and used only by physicians, 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, possession, use, and transfer are subject to the regulations and a general license of the United States 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

- (5) The physician, clinical laboratory or hospital possessing or using radioactive materials under the general license of paragraph (1) of this item shall report in duplicate to the department, any changes in the information furnished by him in the Form GEN 373, "Registration Certificate — In Vitro Testing with Radioactive Material Under General License." The report shall be submitted within 30 days after the effective date of such change.

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TABLE 6 (continued)

Item (j) Medical diagnostic uses.^{13,14} (1) A general license is hereby issued to any physician to transfer, receive, possess or use radioactive materials set forth below for the stated diagnostic uses; provided, however, that the use is in accordance with the respective provisions of paragraphs (2), (3) and (4) of this item; the radioactive materials are in the form of capsules, disposable syringes, or other prepackaged individual doses; and the radioactive material has been manufactured in accordance with a specific license issued by the United States Nuclear Regulatory Commission pursuant to 10 CFR 32.70 or which has been manufactured in accordance with a specific license issued by the department, the New York State Department of Labor, the New York City Department of Health or any agreement State pursuant to licensing requirements equivalent to those contained in 10 CFR 32.70 authorizing distribution under the general license granted in this item or its equivalent:

- (i) Iodine 125 and/or Iodine 131 as sodium iodide for measurement of thyroid uptake;
- (ii) Iodine 125 and/or Iodine 131 as iodinated human serum albumin (IHSA) for determinations of blood and blood plasma volume;
- (iii) Cobalt 57, Cobalt 58 and/or Cobalt 60 for the measurement of intestinal absorption of cyanocobalamin;
- (iv) Chromium 51 as sodium radiochromate for determination of red blood cell volumes and studies of red blood cell survival time.

(2) No physician shall transfer, receive, possess or use radioactive material pursuant to the general license established by paragraph (1) of this item until he has filed Form GEN 371, "Registration Certificate — Medical Use of Radioactive Material Under General License" with the department and received from the department a validated copy of the Form GEN 371 with registration number assigned. The generally licensed physician shall furnish on Form GEN 371 the following information and such other information as may be required by that form:

- (i) name and address of the physician;
- (ii) a statement that the physician is a duly licensed physician authorized to dispense drugs in the practice of medicine in New York State;

¹³ 10 CFR 32.70 (regulations of the United States Nuclear Regulatory Commission) or any equivalent licensing requirement requires manufacturers of radiopharmaceuticals which are under the general license in this paragraph to affix a certain identifying label to the container or in the leaflet or brochure which accompanies the radiopharmaceutical.

¹⁴ The new drug provisions of the Federal Food, Drug and Cosmetic Act also govern the availability and use of any specific diagnostic drugs in interstate commerce.

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TABLE 6 (continued)

- (iii) a statement that the physician, if he is a laboratory director¹⁵ or assists the laboratory director, holds an effective certificate of qualification as such to perform radiobioassay procedures issued by the Clinical Laboratory Center, Division of Laboratories and Research, New York State Department of Health; and
 - (iv) a statement that the physician has appropriate radiation measuring instruments to carry out the diagnostic procedures for which he proposes to use radioactive material under the general license of this item and that he is competent in the use of such instruments.
- (3) A physician who receives, possesses or uses a pharmaceutical containing radioactive material pursuant to the general license established by paragraph (1) of this item shall comply with the following:
- (i) he shall not possess at any one time, pursuant to the general license in paragraph (1) of this item, more than:
 - (a) 200 microcuries of Iodine 131,
 - (b) 200 microcuries of Iodine 125,
 - (c) 5 microcuries of Cobalt 57,
 - (d) 5 microcuries of Cobalt 58,
 - (e) 5 microcuries of Cobalt 60, and
 - (f) 200 microcuries of Chromium 51;
 - (ii) he shall store the pharmaceutical until administered in the original shipping container, or a container providing equivalent radiation protection;
 - (iii) he shall use the pharmaceutical only for the uses authorized by paragraph (1) of this item;
 - (iv) he shall not administer the pharmaceutical to a woman with confirmed pregnancy or to a person under 18 years of age; and
 - (v) he shall not transfer the radioactive material to a person who is not authorized to receive it pursuant to a license issued by the State Department of Health, the State Department of Labor, the New York City Department of Health, the United States Nuclear Regulatory Commission or any agreement State, or in any manner other than in the unopened, labeled shipping container as received from the supplier, except by administering it to a patient.

¹⁵ The term *laboratory director* means a person responsible for administration of the technical and scientific operation of a clinical laboratory or blood bank, including supervision of procedures and reporting of findings of tests.

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TABLE 6 (continued)

(4) The generally licensed physician possessing or using radioactive material under the general license of paragraph (1) of this item shall report in duplicate to the State Department of Health, any changes in the information furnished by him in the "Registration Certificate — Medical Use of Radioactive Material Under General License", Form GEN 371. The report shall be submitted within 30 days after effective date of such change.

APPENDIX 16-A
TABLE 7
RADIOACTIVE SURFACE CONTAMINATION LIMITS

Application	Alpha (dpm/100cm ²)		Beta/Gamma	
	Total	Removable	Total (mR/hr)	Removable (dpm/100cm ²)
Controlled area				
Basic guide	25,000 Max. 5,000 Av.	500	1.0	5,000
Clean area	1,000	100	0.5	1,000
Non-controlled area				
Skin, personal clothing	500	N.D. ²	0.1	N.D. ²
Release of material or facilities	2,500 (Max.) 500 (Av.)	100	0.2	1,000

¹ Measured at 1 cm from the surface.

² N.D.—non-detectable.

APPENDIX 16-A
TABLE 8
PROTECTION FACTORS FOR RESPIRATORS₁

Description ₂	Protection Factors ₄			Tested & Certified Equipment National Institute for Occupational Safety and Health & Mine Safety and Health Administration tests for permissibility
	Modes ₃	Particulates only ₅	Particulates , gases, vapors	
I. Air-Purifying Respirators₆				
Facepiece, half-mask ₇	NP	10		30 CFR 11, Subpart K.
Facepiece, full	NP	50		
Facepiece, half-mask, full, or hood	PP	1000		
II. Atmosphere-Supplying Respirators				
1. Air-Line respirator				
Facepiece, half-mask	CF		1000	30 CFR 11, Subpart J.
Facepiece, half-mask	D		5	
Facepiece, full	CF		2000	
Facepiece, full	D		5	
Facepiece, full	PD		2000	
Hood	CF		Note 8	
Suit	CF		Note 9		Note 10
2. Self-contained breathing apparatus (SCBA)				
Facepiece, full	D		50	30 CFR 11, Subpart H.
Facepiece, full	PD		10,000 ₁₁	
Facepiece, full	RD		50	
Facepiece, full	RP		5,000 ₁₂	
III. Combination Respirators				
Any combination of air- purifying and atmosphere-supplying respirators	Protection factor for type and mode of operation as listed above			30 CFR 11, Sec. 11.63(b).

See next pages for tablenotes.

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TABLE 8
PROTECTION FACTORS FOR RESPIRATORS₁
TABLENOTES

1. For use in the selection of respiratory protective equipment to be used only where the contaminants have been identified and the concentrations, or possible concentrations, are known.
2. Only for shaven faces and where nothing interferes with the seal of tight-fitting facepieces against the skin. Hoods and suits are excepted.
3. The mode symbols are defined as follows:
 - CF = continuous flow
 - D = demand
 - NP = negative pressure, that is, negative phase during inhalation
 - PD = pressure demand, that is, always positive pressure
 - PP = positive pressure
 - RD = demand, recirculating or closed circuit
 - RP = pressure demand, recirculating or closed circuit
4. a. The protection factor is a measure of the degree of protection afforded by a respirator, defined as the ratio of the concentration of airborne radioactive material outside the respiratory protective equipment to that inside the equipment, usually inside the facepiece, under conditions of use. It is applied to the ambient airborne concentration to estimate the concentrations inhaled by the wearer according to the following formula:
$$\text{Concentration inhaled} = \frac{\text{Ambient airborne concentration}}{\text{Protection factor}}$$
- b. The protection factors apply:
 - (i) Only for individuals trained in using respirators and wearing properly fitted respirators that are used and maintained under supervision in a well-planned respiratory protective program.
 - (ii) For air-purifying respirators only when high efficiency particulate filters, above 99.97% removal efficiency by thermally generated 0.3 μm dioctyl phthalate (DOP) test or equivalent, are used in atmospheres not deficient in oxygen and not containing radioactive gas or vapor respiratory hazards.
 - (iii) No adjustment is to be made for the use of sorbents against radioactive material in the form of gases or vapors.
 - (iv) For atmosphere-supplying respirators only when supplied with adequate respirable air. Respirable air shall be provided of the quality and quantity required in accordance with the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration certification described in 30 CFR 11. Oxygen and air shall not be used in the same apparatus.
5. Excluding radioactive contaminants that present an absorption or submersion hazard. For tritium oxide, approximately one-third of the intake occurs by absorption through the skin so that an overall protection factor of less than 2 is appropriate when atmosphere-supplying respirators are used to protect against tritium oxide. If the protection factor for respiratory

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TABLE 8
PROTECTION FACTORS FOR RESPIRATORS₁
TABLENOTES

protective equipment is 5, the effective protection factor for tritium is about 1.4; with protection factors of 10, the effective factor for tritium oxide is about 1.7; and with protection factors of 100 or more, the effective factor for tritium oxide is about 1.9. Air-purifying respirators are not suitable for protection against tritium oxide. See also footnote 9 concerning supplied-air suits.

6. Canisters and cartridges shall not be used beyond service-life limitations.
7. Under-chin type only. This type of respirator is not satisfactory for use where it might be possible, such as, if an accident or emergency were to occur, for the ambient airborne concentrations to reach instantaneous values greater than 10 times the pertinent values in Appendix 16-C, Table 1, Column 3. This type of respirator is not suitable for protection against plutonium or other high-toxicity materials. The mask is to be tested for fit prior to use, each time it is donned.
8.
 - a. Equipment shall be operated in a manner that ensures that proper air flow-rates are maintained. A protection factor of no more than 1000 may be utilized for tested and-certified supplied-air hoods when a minimum air flow of 6 cubic feet per minute (0.17 m³/min) is maintained and calibrated air line pressure gauges or flow measuring devices are used. A protection factor of up to 2000 may be used for tested and certified hoods only when the air flow is maintained at the manufacturer's recommended maximum rate for the equipment, this rate is greater than 6 cubic feet per minute (0.17 m³/min) and calibrated air line pressure gauges or flow measuring devices are used.
 - b. The design of the supplied-air hood or helmet, with a minimum flow of 6 cubic feet per minute (0.17 m³/min) of air, may determine its overall efficiency and the protection it provides. For example, some hoods aspirate contaminated air into the breathing zone when the wearer works with hands-over-head. This aspiration may be overcome if a short cape-like extension to the hood is worn under a coat or overalls. Other limitations specified by the approval agency shall be considered before using a hood in certain types of atmospheres. See footnote 9.
9. Appropriate protection factors shall be determined, taking into account the design of the suit and its permeability to the contaminant under conditions of use. There shall be a standby rescue person equipped with a respirator or other apparatus appropriate for the potential hazards and communications equipment whenever supplied-air suits are used.
10. No approval schedules are currently available for this equipment. Equipment is to be evaluated by testing or on the basis of reliable test information.
11. This type of respirator may provide greater protection and be used as an emergency device in unknown concentrations for protection against inhalation hazards. External radiation hazards and other limitations to permitted exposure, such as skin absorption, must be taken into account in such circumstances.

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TABLE 8
PROTECTION FACTORS FOR RESPIRATORS₁
TABLENOTES

12. Quantitative fit testing shall be performed on each individual, and no more than 0.02% leakage is allowed with this type of apparatus. Perceptible outward leakage of gas from this or any positive pressure self-contained breathing apparatus is unacceptable because service life will be reduced substantially. Special training in the use of this type of apparatus shall be provided to the wearer.

Note 1: Protection factors for respirators approved by the U.S. Bureau of Mines and the National Institute for Occupational Safety and Health, according to applicable approvals for respirators for type and mode of use to protect against airborne radionuclides, may be used to the extent that they do not exceed the protection factors listed in this table. The protection factors listed in this table may not be appropriate to circumstances where chemical or other respiratory hazards exist in addition to radioactive hazards. The selection and use of respirators for such circumstances should take into account applicable approvals of the U.S. Bureau of Mines and the National Institute for Occupational Safety and Health.

Note 2: Radioactive contaminants, for which the concentration values in Appendix 16-C, Table 1, Column 3 are based on internal dose due to inhalation, may present external exposure hazards at higher concentrations. Under these circumstances, limitations on occupancy may have to be governed by external dose limits.

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Table 9

QUANTITIES¹ OF LICENSED MATERIAL REQUIRING LABELING

Radionuclide	Quantity (uCi)*	Radionuclide	Quantity (uCi)*
Gallium-66	100	Bromine-80	1,000
Gallium-67	1,000	Bromine-82	100
Gallium-68	1,000	Bromine-83	1,000
Gallium-70	1,000	Bromine-84	1,000
Gallium-72	100	Krypton-74	1,000
Gallium-73	1,000	Krypton-76	1,000
Germanium-66	1,000	Krypton-77	1,000
Germanium-67	1,000	Krypton-79	1,000
Germanium-68	10	Krypton-81	1,000
Germanium-69	1,000	Krypton-83m	1,000
Germanium-71	1,000	Krypton-85m	1,000
Germanium-75	1,000	Krypton-85	1,000
Germanium-77	1,000	Krypton-87	1,000
Germanium-78	1,000	Krypton-88	1,000
Arsenic-69	1,000	Rubidium-79	1,000
Arsenic-70	1,000	Rubidium-81m	1,000
Arsenic-71	100	Rubidium-81	1,000
Arsenic-72	100	Rubidium-82m	1,000
Arsenic-73	100	Rubidium-83	100
Arsenic-74	100	Rubidium-84	100
Arsenic-76	100	Rubidium-86	100
Arsenic-77	100	Rubidium-87	100
Arsenic-78	1,000	Rubidium-88	1,000
Selenium-70	1,000	Rubidium-89	1,000
Selenium-73m	1,000	Strontium-80	100
Selenium-73	100	Strontium-81	1,000
Selenium-75	100	Strontium-83	100
Selenium-79	100	Strontium-85m	1,000
Selenium-81m	1,000	Strontium-85	100
Selenium-81	1,000	Strontium-87m	1,000
Selenium-83	1,000	Strontium-89	10
Bromine-74m	1,000	Strontium-90	0.1
Bromine-74	1,000	Strontium-91	100
Bromine-75	1,000	Strontium-92	100
Bromine-76	100	Yttrium-86m	1,000
Bromine-77	1,000	Yttrium-86	100
Bromine-80m	1,000	Yttrium-87	100

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Table 9

QUANTITIES¹ OF LICENSED MATERIAL REQUIRING LABELING

Radionuclide	Quantity (uCi)*	Radionuclide	Quantity (uCi)*
Yttrium-88	10	Technetium-97m	100
Yttrium-90m	1,000	Technetium-97	1,000
Yttrium-90	10	Technetium-98	10
Yttrium-91m	1,000	Technetium-99m	1,000
Yttrium-91	10	Technetium-99	100
Yttrium-92	100	Technetium-101	1,000
Yttrium-93	100	Technetium-104	1,000
Yttrium-94	1,000	Ruthenium-94	1,000
Yttrium-95	1,000	Ruthenium-97	1,000
Zirconium-86	100	Ruthenium-103	100
Zirconium-88	10	Ruthenium-105	1,000
Zirconium-89	100	Ruthenium-106	1
Zirconium-93	1	Rhodium-99m	1,000
Zirconium-95	10	Rhodium-99	100
Zirconium-97	100	Rhodium-100	100
Niobium-88	1,000	Rhodium-101m	1,000
Niobium-89m (66min)	1,000	Rhodium-101	10
Niobium-89 (122min)	1,000	Rhodium-102m	10
Niobium-90	100	Rhodium-102	10
Niobium-93m	10	Rhodium-103m	1,000
Niobium-94	1	Rhodium-105	100
Niobium-95m	100	Rhodium-106m	1,000
Niobium-95	100	Rhodium-107	1,000
Niobium-96	100	Palladium-100	100
Niobium-97	1,000	Palladium-101	1,000
Niobium-98	1,000	Palladium-103	100
Molybdenum-90	100	Palladium-107	10
Molybdenum-93m	100	Palladium-109	100
Molybdenum-93	10	Silver-102	1,000
Molybdenum-99	100	Silver-103	1,000
Molybdenum-101	1,000	Silver-104m	1,000
Technetium-93m	1,000	Silver-104	1,000
Technetium-93	1,000	Silver-105	100
Technetium-94m	1,000	Silver-106m	100
Technetium-94	1,000	Silver-106	1,000
Technetium-96m	1,000	Silver-108m	1
Technetium-96	100	Silver-110m	10

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Table 9

QUANTITIES¹ OF LICENSED MATERIAL REQUIRING LABELING

Radionuclide	Quantity (uCi)*	Radionuclide	Quantity (uCi)*
Silver-111	100	Tin-128	1,000
Silver-112	100	Antimony-115	1,000
Silver-115	1,000	Antimony-116m	1,000
Cadmium-104	1,000	Antimony-116	1,000
Cadmium-107	1,000	Antimony-117	1,000
Cadmium-109	1	Antimony-118m	1,000
Cadmium-113m	0.1	Antimony-119	1,000
Cadmium-113	100	Antimony-120 (16min)	1,000
Cadmium-115m	10	Antimony-120 (5.7d)	100
Cadmium-115	100	Antimony-122	100
Cadmium-117m	1,000	Antimony-124m	1,000
Cadmium-117	1,000	Antimony-124	10
Indium-109	1,000	Antimony-125	100
Indium-110 (69.1min)	1,000	Antimony-126m	1,000
Indium-110 (4.9h)	1,000	Antimony-126	100
Indium-111	100	Antimony-127	100
Indium-112	1,000	Antimony-128 (10.4min)	1,000
Indium-113m	1,000	Antimony-128 (9.01h)	100
Indium-114m	10	Antimony-129	100
Indium-115m	1,000	Antimony-130	1,000
Indium-115	100	Antimony-131	1,000
Indium-116m	1,000	Tellurium-116	1,000
Indium-117m	1,000	Tellurium-121m	10
Indium-117	1,000	Tellurium-121	100
Indium-119m	1,000	Tellurium-123m	10
Tin-110	100	Tellurium-123	100
Tin-111	1,000	Tellurium-125m	10
Tin-113	100	Tellurium-127m	10
Tin-117m	100	Tellurium-127	1,000
Tin-119m	100	Tellurium-129m	10
Tin-121m	100	Tellurium-129	1,000
Tin-121	1,000	Tellurium-131m	10
Tin-123m	1,000	Tellurium-131	100
Tin-123	10	Tellurium-132	10
Tin-125	10	Tellurium-133m	100
Tin-126	10	Tellurium-133	1,000
Tin-127	1,000	Tellurium-134	1,000

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Table 9

QUANTITIES¹ OF LICENSED MATERIAL REQUIRING LABELING

Radionuclide	Quantity (uCi)*	Radionuclide	Quantity (uCi)*
Iodine-120m	1,000	Cesium-135m	1,000
Iodine-120	100	Cesium-135	100
Iodine-121	1,000	Cesium-136	10
Iodine-123	100	Cesium-137	10
Iodine-124	10	Cesium-138	1,000
Iodine-125	1	Barium-126	1,000
Iodine-126	1	Barium-128	100
Iodine-128	1,000	Barium-131m	1,000
Iodine-129	1	Barium-131	100
Iodine-130	10	Barium-133m	100
Iodine-131	1	Barium-133	100
Iodine-132m	100	Barium-135m	100
Iodine-132	100	Barium-139	1,000
Iodine-133	10	Barium-140	100
Iodine-134	1,000	Barium-141	1,000
Iodine-135	100	Barium-142	1,000
Xenon-120	1,000	Lanthanum-131	1,000
Xenon-121	1,000	Lanthanum-132	100
Xenon-122	1,000	Lanthanum-135	1,000
Xenon-123	1,000	Lanthanum-137	10
Xenon-125	1,000	Lanthanum-138	100
Xenon-127	1,000	Lanthanum-140	100
Xenon-129m	1,000	Lanthanum-141	100
Xenon-131m	1,000	Lanthanum-142	1,000
Xenon-133m	1,000	Lanthanum-143	1,000
Xenon-133	1,000	Cerium-134	100
Xenon-135m	1,000	Cerium-135	100
Xenon-135	1,000	Cerium-137m	100
Xenon-138	1,000	Cerium-137	1,000
Cesium-125	1,000	Cerium-139	100
Cesium-127	1,000	Cerium-141	100
Cesium-129	1,000	Cerium-143	100
Cesium-130	1,000	Cerium-144	1
Cesium-131	1,000	Praseodymium-136	1,000
Cesium-132	100	Praseodymium-137	1,000
Cesium-134m	1,000	Praseodymium-138m	1,000
Cesium-134	10	Praseodymium-139	1,000

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Table 9

QUANTITIES¹ OF LICENSED MATERIAL REQUIRING LABELING

Radionuclide	Quantity (uCi)*	Radionuclide	Quantity (uCi)*
Praseodymium-142m	1,000	Europium-147	100
Praseodymium-142	100	Europium-148	10
Praseodymium-143	100	Europium-149	100
Praseodymium-144	1,000	Europium-150 (12.62h)	100
Praseodymium-145	100	Europium-150 (34.2y)	1
Praseodymium-147	1,000	Europium-152m	100
Neodymium-136	1,000	Europium-152	1
Neodymium-138	100	Europium-154	1
Neodymium-139m	1,000	Europium-155	10
Neodymium-139	1,000	Europium-156	100
Neodymium-141	1,000	Europium-157	100
Neodymium-147	100	Europium-158	1,000
Neodymium-149	1,000	Gadolinium-145	1000
Neodymium-151	1,000	Gadolinium-146	10
Promethium-141	1,000	Gadolinium-147	100
Promethium-143	100	Gadolinium-148	0.001
Promethium-144	10	Gadolinium-149	100
Promethium-145	10	Gadolinium-151	10
Promethium-146	1	Gadolinium-152	100
Promethium-147	10	Gadolinium-153	10
Promethium-148m	10	Gadolinium-159	100
Promethium-148	10	Terbium-147	1,000
Promethium-149	100	Terbium-149	100
Promethium-150	1,000	Terbium-150	1,000
Promethium-151	100	Terbium-151	100
Samarium-141m	1,000	Terbium-153	1,000
Samarium-141	1,000	Terbium-154	100
Samarium-142	1,000	Terbium-155	1,000
Samarium-145	100	Terbium-156m (5.0h)	1,000
Samarium-146	1	Terbium-156m (24.4h)	1,000
Samarium-147	100	Terbium-156	100
Samarium-151	10	Terbium-157	10
Samarium-153	100	Terbium-158	1
Samarium-155	1,000	Terbium-160	10
Samarium-156	1,000	Terbium-161	100
Europium-145	100	Dysprosium-155	1,000
Europium-146	100	Dysprosium-157	1,000

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Table 9

QUANTITIES¹ OF LICENSED MATERIAL REQUIRING LABELING

Radionuclide	Quantity (uCi)*	Radionuclide	Quantity (uCi)*
Dysprosium-159	100	Lutetium-172	100
Dysprosium-165	1,000	Lutetium-173	10
Dysprosium-166	100	Lutetium-174m	10
Holmium-155	1,000	Lutetium-174	10
Holmium-157	1,000	Lutetium-176m	1,000
Holmium-159	1,000	Lutetium-176	100
Holmium-161	1,000	Lutetium-177m	10
Holmium-162m	1,000	Lutetium-177	100
Holmium-162	1,000	Lutetium-178m	1,000
Holmium-164m	1,000	Lutetium-178	1,000
Holmium-164	1,000	Lutetium-179	1,000
Holmium-166m	1	Hafnium-170	100
Holmium-166	100	Hafnium-172	1
Holmium-167	1,000	Hafnium-173	1,000
Erbium-161	1,000	Hafnium-175	100
Erbium-165	1,000	Hafnium-177m	1,000
Erbium-169	100	Hafnium-178m	0.1
Erbium-171	100	Hafnium-179m	10
Erbium-172	100	Hafnium-180m	1,000
Thulium-162	1,000	Hafnium-181	10
Thulium-166	100	Hafnium-182m	1,000
Thulium-167	100	Hafnium-182	0.1
Thulium-170	10	Hafnium-183	1,000
Thulium-171	10	Hafnium-184	100
Thulium-172	100	Tantalum-172	1,000
Thulium-173	100	Tantalum-173	1,000
Thulium-175	1,000	Tantalum-174	1,000
Ytterbium-162	1,000	Tantalum-175	1,000
Ytterbium-166	100	Tantalum-176	100
Ytterbium-167	1,000	Tantalum-177	1,000
Ytterbium-169	100	Tantalum-178	1,000
Ytterbium-175	100	Tantalum-179	100
Ytterbium-177	1,000	Tantalum-180m	1,000
Ytterbium-178	1,000	Tantalum-180	100
Lutetium-169	100	Tantalum-182m	1,000
Lutetium-170	100	Tantalum-182	10
Lutetium-171	100	Tantalum-183	100

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Table 9

QUANTITIES¹ OF LICENSED MATERIAL REQUIRING LABELING

Radionuclide	Quantity (μ Ci)*	Radionuclide	Quantity (μ Ci)*
Tantalum-184	100	Iridium-187	1,000
Tantalum-185	1,000	Iridium-188	100
Tantalum-186	1,000	Iridium-189	100
Tungsten-176	1,000	Iridium-190m	1,000
Tungsten-177	1,000	Iridium-190	100
Tungsten-178	1,000	Iridium-192m (1.4min)	10
Tungsten-179	1,000	Iridium-192 (73.8d)	1
Tungsten-181	1,000	Iridium-194m	10
Tungsten-185	100	Iridium-194	100
Tungsten-187	100	Iridium-195m	1,000
Tungsten-188	10	Iridium-195	1,000
Rhenium-177	1,000	Platinum-186	1,000
Rhenium-178	1,000	Platinum-188	100
Rhenium-181	1,000	Platinum-189	1,000
Rhenium-182 (12.7h)	1,000	Platinum-191	100
Rhenium-182 (64.0h)	100	Platinum-193m	100
Rhenium-184m	10	Platinum-193	1,000
Rhenium-184	100	Platinum-195m	100
Rhenium-186m	10	Platinum-197m	1,000
Rhenium-186	100	Platinum-197	100
Rhenium-187	1,000	Platinum-199	1,000
Rhenium-188m	1,000	Platinum-200	100
Rhenium-188	100	Gold-193	1,000
Rhenium-189	100	Gold-194	100
Osmium-180	1,000	Gold-195	10
Osmium-181	1,000	Gold-198m	100
Osmium-182	100	Gold-198	100
Osmium-185	100	Gold-199	100
Osmium-189m	1,000	Gold-200m	100
Osmium-191m	1,000	Gold-200	1,000
Osmium-191	100	Gold-201	1,000
Osmium-193	100	Mercury-193m	100
Osmium-194	1	Mercury-193	1,000
Iridium-182	1,000	Mercury-194	1
Iridium-184	1,000	Mercury-195m	100
Iridium-185	1,000	Mercury-195	1,000
Iridium-186	100	Mercury-197m	100

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Table 9

QUANTITIES¹ OF LICENSED MATERIAL REQUIRING LABELING

Radionuclide	Quantity (uCi)*	Radionuclide	Quantity (uCi)*
Mercury-197	1,000	Bismuth-212	10
Mercury-199m	1,000	Bismuth-213	10
Mercury-203	100	Bismuth-214	100
Thallium-194m	1,000	Polonium-203	1,000
Thallium-194	1,000	Polonium-205	1,000
Thallium-195	1,000	Polonium-207	1,000
Thallium-197	1,000	Polonium-210	0.1
Thallium-198m	1,000	Astatine-207	100
Thallium-198	1,000	Astatine-211	10
Thallium-199	1,000	Radon-220	1
Thallium-201	1,000	Radon-222	1
Thallium-200	1,000	Francium-222	100
Thallium-202	100	Radium-223	0.1
Thallium-204	100	Radium-224	0.1
Lead-195m	1,000	Radium-225	0.1
Lead-198	1,000	Radium-226	0.1
Lead-199	1,000	Radium-227	1,000
Lead-200	100	Radium-228	0.1
Lead-201	1,000	Actinium-224	1
Lead-202m	1,000	Actinium-225	0.01
Lead-202	10	Actinium-226	0.1
Lead-203	1,000	Actinium-227	0.001
Lead-205	100	Actinium-228	1
Lead-209	1,000	Thorium-226	10
Lead-210	0.01	Thorium-227	0.01
Lead-211	100	Thorium-228	0.001
Lead-212	1	Thorium-229	0.001
Lead-214	100	Thorium-230	0.001
Bismuth-200	1,000	Thorium-231	100
Bismuth-201	1,000	Thorium-232	100
Bismuth-202	1,000	Thorium-234	10
Bismuth-203	100	Thorium-natural	100
Bismuth-205	100	Protactinium-227	10
Bismuth-206	100	Protactinium-228	1
Bismuth-207	10	Protactinium-230	0.1
Bismuth-210m	0.1	Protactinium-231	0.001
Bismuth-210	1	Protactinium-232	1

APPENDIX 16-A

Table 9

QUANTITIES¹ OF LICENSED MATERIAL REQUIRING LABELING

Radionuclide	Quantity (μCi)*	Radionuclide	Quantity (μCi)*
Protactinium-233	100	Americium-238	100
Protactinium-234	100	Americium-239	1,000
Uranium-230	0.01	Americium-240	100
Uranium-231	100	Americium-241	0.001
Uranium-232	0.001	Americium-242m	0.001
Uranium-233	0.001	Americium-242	10
Uranium-234	0.001	Americium-243	0.001
Uranium-235	0.001	Americium-244m	100
Uranium-236	0.001	Americium-244	10
Uranium-237	100	Americium-245	1,000
Uranium-238	100	Americium-246m	1,000
Uranium-239	1,000	Americium-246	1,000
Uranium-240	100	Curium-238	100
Uranium-natural	100	Curium-240	0.1
Neptunium-232	100	Curium-241	1
Neptunium-233	1,000	Curium-242	0.01
Neptunium-234	100	Curium-243	0.001
Neptunium-235	100	Curium-244	0.001
Neptunium-236 (1.15E+5y)	0.001	Curium-245	0.001
Neptunium-236 (22.5h)	1	Curium-246	0.001
Neptunium-237	0.001	Curium-247	0.001
Neptunium-238	10	Curium-248	0.001
Neptunium-239	100	Curium-249	1,000
Neptunium-240	1,000	Berkelium-245	100
Plutonium-234	10	Berkelium-246	100
Plutonium-235	1,000	Berkelium-247	0.001
Plutonium-236	0.001	Berkelium-249	0.1
Plutonium-237	100	Berkelium-250	10
Plutonium-238	0.001	Californium-244	100
Plutonium-239	0.001	Californium-246	1
Plutonium-240	0.001	Californium-248	0.01
Plutonium-241	0.01	Californium-249	0.001
Plutonium-242	0.001	Californium-250	0.001
Plutonium-243	1,000	Californium-251	0.001
Plutonium-244	0.001	Californium-252	0.001
Plutonium-245	100	Californium-253	0.1
Americium-237	1,000	Californium-254	0.001

APPENDIX 16-A

Table 9

QUANTITIES¹ OF LICENSED MATERIAL REQUIRING LABELING

Radionuclide	Quantity (μ Ci)*	Radionuclide	Quantity (μ Ci)*
Einsteinium-250	100	Any alpha-emitting radionuclide not listed above or mixtures of alpha emitters of unknown composition	0.001
Einsteinium-251	100		
Einsteinium-253	0.1		
Einsteinium-254m	1		
Einsteinium-254	0.01		
Fermium-252	1	Any radionuclide other than alpha-emitting radionuclides not listed above, or mixtures of beta emitters of unknown composition	0.01
Fermium-253	1		
Fermium-254	10		
Fermium-255	1		
Fermium-257	0.01		
Mendelevium-257	10		
Mendelevium-258	0.01		

NOTE: For purposes of sections 16.12(b)(1)(v), 16.12 (c)(4)(i), and 16.15(a)(1) where there is involved a combination of radionuclides in known amounts, the limit for the combination shall be derived as follows: determine, for each radionuclide in the combination, the ratio between the quantity present in the combination and the limit otherwise established for the specific radionuclide when not in combination. The sum of such ratios for all radionuclides in the combination may not exceed "1" -- that is, unity.

¹The quantities listed above were derived by taking 1/10th of the most restrictive ALI listed in Table 1, Columns 1 and 2, of Appendix 16-C, rounding to the nearest factor of 10, and constraining the values listed between 37 Bq and 37 MBq (0.001 and 1,000 μ Ci). Values of 3.7 MBq (100 μ Ci) have been assigned for radionuclides having a radioactive half-life in excess of E+9 years, except rhenium, 37 MBq (1,000 μ Ci), to take into account their low specific activity.

* To convert μ Ci to kBq, multiply the μ Ci value by 37