Tantalum 182 (Ta 182)
Technetium 96 (Tc 96)
Technetium 97m (Tc 97m)
Technetium 97 (Tc 97)
Technetium 99m (Tc 99m)
Technetium 99 (Tc 99)
Tellurium 125m (Te 125m)
Tellurium 127m (Te 127m)
Tellurium 127 (Te 127)
Tellurium 129m (Te 129m)
Tellurium 129 (Te 129)
Tellurium 131m (Te 131m)
Tellurium 132 (Te 132)
Terbium 160 (Tb 160)
Thallium 200 (Tl 200)
Thallium 201 (Tl 201)
Thallium 202 (Tl 202)
Thallium 204 (Tl 204)
Thulium 170 (Tm 170)
Thulium 171 (Tm 171)
Tin 113 (Sn 113)
Tin 123 (Sn 123)
Tin 125 (Sn 125)
Tin 126 (Sn 126)
Titanium 44 (Ti 44)
Tritium (H3)
Tungsten 181 (W 181)
Tungsten 185 (W 185)
Tungsten 187 (W 187)
Vanadium 48 (V 48)
Xenon 131m (Xe 131m)
Xenon 133 (Xe 133)
Xenon 135 (Xe 135)
Ytterbium 175 (Yb 175)
Yttrium 87 (Y 87)
Yttrium 88 (Y 88)
Yttrium 90 (Y 90)
Yttrium 91 (Y 91)
Yttrium 92 (Y 92)
Yttrium 93 (Y 93)
Zinc 65 (Zn 65)
Zinc 69m (Zn 69m)
Zinc 69 (Zn 69)
Zirconium 93 (Zr 93)
Zirconium 95 (Zr 95)
Zirconium 97 (Zr 97)

[58 FR 13005, Mar. 9, 1993, as amended at 59 FR 48998, Sept. 26, 1994. Redesignated and amended at 61 FR 35603, 35607, July 8, 1996; 65 FR 70292, Nov. 22, 2000; 71 FR 20339, Apr. 20, 2006; 75 FR 44093, July 28, 2010]

APPENDIX M TO PART 110—CATEGORIZATION OF NUCLEAR MATERIAL [d]

[From IAEA INFCIRC/225, Rev. 1]

Material	Form	Category		
		I	II	III [e]
1. Plutonium [a]	Unirradiated [b]	2 kg or more	Less than 2 kg but more than 500 g.	500 g or less.
2. Uranium-235 [c]	Unirradiated: [b]			
	Uranium enriched to 20 pct U^{235} or more.	5 kg or more	Less than 5 kg but more than 1 kg.	1 kg or less.
	Uranium enriched to 10 pct U^{235} but less than 20 pct.		10 kg or more	Less than 10 kg.
	Uranium enriched above natural, but less than 10 pct U^{235}.			10 kg or more.
3. Uranium-233	Unirradiated [b]	2 kg or more	Less than 2 kg but more than 500 g.	500 g or less.

[a] All plutonium except that with isotopic concentration exceeding 80 pct in plutonium-238.
[b] Material not irradiated in a reactor or material irradiated in a reactor but with a radiation level equal to or less than 100 rd/h at 1 m unshielded.
[c] Natural uranium, depleted uranium, thorium and quantities of uranium enriched to less than 10% not falling into Category III should be protected in accordance with prudent management practice.
[d] Irradiated fuel should be protected as category I, II, or III nuclear material depending on the category of the fresh fuel. However, fuel which by virtue of its original fissile material content is included as category I or II before irradiation should only be reduced one category level, while the radiation level from the fuel exceeds 100 rd/h at 1 m unshielded.
[e] Physical security determinations will not be required for 15 g or less of plutonium, uranium-233 or high-enriched uranium, or for 1 kg or less of uranium with an enrichment between 10 and 20 pct in uranium-235.

(Sec. 161, as amended, Pub. L. 83-703, 68 Stat. 948 (42 U.S.C. 2201); sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1243 (42 U.S.C. 5841))

[43 FR 21641, May 19, 1978. Redesignated and amended at 49 FR 47204, Dec. 3, 1984. Further redesignated at 55 FR 30450, July 26, 1990; 58 FR 13005, Mar. 9, 1993; 61 FR 35603, July 8, 1996]

APPENDIX N TO PART 110—ILLUSTRATIVE LIST OF LITHIUM ISOTOPE SEPARATION FACILITIES, PLANTS AND EQUIPMENT UNDER NRC'S EXPORT LICENSING AUTHORITY

a. Facilities or plants for the separation of lithium isotopes.

b. Equipment for the separation of lithium isotopes, such as:

(1) Packed liquid-liquid exchange columns especially designed for lithium amalgams;

(2) Mercury and/or lithium amalgam pumps;

(3) Lithium amalgam electrolysis cells;

(4) Evaporators for concentrated lithium hydroxide solution.

[65 FR 70292, Nov. 22, 2000]

APPENDIX O TO PART 110—ILLUSTRATIVE LIST OF FUEL ELEMENT FABRICATION PLANT EQUIPMENT AND COMPONENTS UNDER NRC'S EXPORT LICENSING AUTHORITY

NOTE: Nuclear fuel elements are manufactured from source or special nuclear material. For oxide fuels, the most common type of fuel equipment for pressing pellets, sintering, grinding and grading will be present.

Mixed oxide fuels are handled in glove boxes (or equivalent containment) until they are sealed in the cladding. In all cases the fuel is hermetically sealed inside a suitable cladding which is designed to be the primary envelope encasing the fuel so as to provide suitable performance and safety during reactor operation. Also, in all cases precise control of processes, procedures and equipment to extremely high standards is necessary in order to ensure predictable and safe fuel performance.

(a) Items that are considered especially designed or prepared for the fabrication of fuel elements include equipment that:

(1) Normally comes in direct contact with, or directly processes or controls, the production flow of nuclear material;

(2) Seals the nuclear material within the cladding;

(3) Checks the integrity of the cladding or the seal; and

(4) Checks the finished treatment of the sealed fuel.

(b) This equipment or systems of equipment may include, for example:

(1) Fully automatic pellet inspection stations especially designed or prepared for checking final dimensions and surface defects of fuel pellets;

(2) Automatic welding machines especially designed or prepared for welding end caps onto the fuel pins (or rods);

(3) Automatic test and inspection stations especially designed or prepared for checking the integrity of completed fuel pins (or rods). This item typically includes equipment for:

(i) X-ray examination of pin (or rod) end cap welds;

(ii) Helium leak detection from pressurized pins (or rods); and

(iii) Gamma-ray scanning of the pins (or rods) to check for correct loading of the fuel pellets inside.

[65 FR 70292, Nov. 22, 2000]

APPENDIX P TO PART 110—CATEGORY 1 AND 2 RADIOACTIVE MATERIAL

TABLE 1—IMPORT AND EXPORT THRESHOLD LIMITS

Radioactive material	Category 1		Category 2	
	Terabequerels (TBq)	Curies (Ci) [1]	Terabequerels (TBq)	Curies (Ci) [1]
Americium-241	60	1,600	0.6	16
Americium-241/Be	60	1,600	0.6	16
Californium-252	20	540	0.2	5.4
Curium-244	50	1,400	0.5	14
Cobalt-60	30	810	0.3	8.1
Cesium-137	100	2,700	1.0	27
Gadolinium-153	1,000	27,000	10.0	270
Iridium-192	80	2,200	0.8	22
Plutonium-238[2]	60	1,600	0.6	16
Plutonium-239/Be[2]	60	1,600	0.6	16
Promethium-147	40,000	1,100,000	400	11,000
Radium-226[a]	40	1,100	0.4	11
Selenium-75	200	5,400	2.0	54
Strontium-90 (Y–90)	1,000	27,000	10.0	270
Thulium-170	20,000	540,000	200	5,400
Ytterbium-169	300	8,100	3.0	81

[1] The values to be used to determine whether a license is required are given in TBq. Curie (Ci) values are provided for practical usefulness only and are rounded after conversion.

[2] The limits for Pu-238 and Pu-239/Be in this table apply for imports to the U.S. The limits for exports of Pu-238 and Pu-239/Be can be found in §110.21.

[a] Discrete sources of radium-226.

Calculation of Shipments Containing Multiple Sources or Radionuclides

The ''sum of fractions'' methodology for evaluating combinations of radionuclides being transported, is to be used when import or export shipments contain multiple sources or multiple radionuclides. The threshold limit values used in a sum of the fractions calculation must be the metric values (*i.e.*, TBq).

I. If multiple sources and/or multiple radionuclides are present in an import or export shipment, the sum of the fractions of the activity of each radionuclides must be determined to verify the shipment is less than the Category 1 or 2 limits of Table 1, as appropriate. If the calculated sum of the fractions ratio, using the following equation, is greater than or equal to 1.0, then the import or export shipment exceeds the threshold limits of Table 1 and the applicable security provisions of this part apply.

II. Use the equation below to calculate the sum of the fractions ratio by inserting the actual activity of the applicable radionuclides or of the individual sources (of the same radionuclides) in the numerator of the