

## Chapter HFS 157

## APPENDIX C

## LIMITS FOR BROAD LICENSES

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

## LIMITS FOR BROAD LICENSES (Cont.)

Radioactive Material	Type B License	Type C License	Radioactive Material	Type B License	Type C License
	Column I	Column II		Column I	Column II
	curies	curies		curies	curies
Neodymium-147	10	0.1	Silver-105	1	0.01
Neodymium-149	10	0.1	Silver-110m	0.1	0.001
Nickel-59	10	0.1	Silver-111	10	0.1
Nickel-63	1	0.01	Sodium-22	0.1	0.001
Nickel-65	10	0.1	Sodium-24	1	0.01
Niobium-93m	1	0.01	Strontium-85m	1,000	10
Niobium-95	1	0.01	Strontium-85	1	0.01
Niobium-97	100	1.	Strontium-89	1	0.01
Osmium-185	1	0.01	Strontium-90	0.01	0.0001
Osmium-191m	100	1.	Strontium-91	10	0.1
Osmium-191	10	0.1	Strontium-92	10	0.1
Osmium-193	10	0.1	Sulphur-35	10	0.1
Palladium-103	10	0.1	Tantalum-182	1	0.01
Palladium-109	10	0.1	Technetium-96	10	0.1
Phosphorus-32	1	0.01	Technetium-97m	10	0.1
Platinum-191	10	0.1	Technetium-97	10	0.1
Platinum-193m	100	1.	Technetium-99m	100	1.
Platinum-193	10	0.1	Technetium-99	1	0.01
Platinum-197m	100	1.	Tellurium-125m	1	0.01
Platinum-197	10	0.1	Tellurium-127m	1	0.01
Polonium-210	0.01	0.0001	Tellurium-127	10	0.1
Potassium-42	1	0.01	Tellurium-129m	1	0.01
Praseodymium-142	10	0.1	Tellurium-129	100	1.
Praseodymium-143	10	0.1	Tellurium-131m	10	0.1
Promethium-147	1	0.01	Tellurium-132	1	0.01
Promethium-149	10	0.1	Terbium-160	1	0.01
Radium-226	0.01	0.0001	Thallium-200	10	0.1
Rhenium-186	10	0.1	Thallium-201	10	0.1
Rhenium-188	10	0.1	Thallium-202	10	0.1
Rhodium-103m	1,000	10.	Thallium-204	1	0.01
Rhodium-105	10	0.1	Thulium-170	1	0.01
Rubidium-86	1	0.01	Thulium-171	1	0.01
Rubidium-87	1	0.01	Tin-113	1	0.01
Ruthenium-97	100	1.	Tin-125	1	0.01
Ruthenium-103	1	0.01	Tungsten-181	1	0.01
Ruthenium-105	10	0.1	Tungsten-185	1	0.01
Ruthenium-106	0.1	0.001	Tungsten-187	10	0.1
Samarium-151	1	0.01	Vanadium-48	1	0.01
Samarium-153	10	0.1	Xenon-131m	1,000	10.
Scandium-46	1	0.01	Xenon-133	100	1.
Scandium-47	10	0.1	Xenon-135	100	1.
Scandium-48	1	0.01	Ytterbium-175	10	0.1
Selenium-75	1	0.01	Yttrium-90	1	0.01
Silicon-31	10	0.1	Yttrium-91	1	0.01
			Yttrium-92	10	0.1

**LIMITS FOR BROAD LICENSES (Cont.)**

<b>Radioactive Material</b>	<b>Type B License</b>	<b>Type C License</b>
	<b>Column I</b>	<b>Column II</b>
	<b>curies</b>	<b>curies</b>
Yttrium-93	1	0.01
Zinc-65	1	0.01
Zinc-69m	10	0.1
Zinc-69	100	1.
Zirconium-93	1	0.01
Zirconium-95	1	0.01
Zirconium-97	1	0.01

Any radioactive material other than source material, special nuclear material, or alpha emitting radioactive material not listed above.

0.1                      0.001

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

Example: Zirconium-97 (Col. II) (0.01 Ci multiplied by 37 is equivalent to 0.37 GBq).