AMENDATORY SECTION (Amending WSR 01-02-068, filed 12/29/00, effective 1/29/01)

WAC 246-232-006 Exemption of certain source material. (1) A person is exempt from this chapter and chapters 246-233 and 246-235 WAC to the extent that the person receives, possesses, uses, owns, or transfers source material in any chemical mixture, compound, solution or alloy in which the source material is by weight less than 1/20 of one percent (0.05 percent) of the mixture, compound, solution, or alloy.

(2) A person is exempt from this chapter and chapters 246-233 and 246-235 WAC to the extent that the person receives, possesses, uses or transfers unrefined and unprocessed ore containing source material, provided such person shall not refine or process such ore unless authorized to do so in a specific license.

(3) A person is exempt from this chapter and chapters 246-233 and 246-235 WAC to the extent that the person receives, possesses, uses or transfers:

(a) Any quantities of thorium contained in:

(i) Incandescent gas mantles;

(ii) Vacuum tubes;

(iii) Welding rods;

(iv) Electric lamps for illuminating purposes if each lamp contains fifty milligrams or less of thorium;

(v) Germicidal lamps, sunlamps and lamps for outdoor or industrial lighting if each lamp contains two grams or less of thorium;

(vi) Rare earth metals and compounds, mixtures, and products containing 0.25 percent or less by weight thorium, uranium, or any combination of these; or

(vii) Personnel neutron dosimeters if each dosimeter contains 1.85 gigabecquerels (50 milligrams) or less of thorium;

(b) Source material contained in the following products:

(i) Glazed ceramic tableware if the glaze contains twenty percent or less by weight source material; and

(ii) Piezoelectric ceramic containing two percent or less by weight source material;

(c) Photographic film, negatives and prints containing uranium or thorium;

(d) Any finished product or part fabricated of, or containing, tungsten-thorium or magnesium-thorium alloys if the thorium content of the alloy is four percent or less by weight. The exemption contained in this subparagraph shall not be deemed to authorize the chemical, physical or metallurgical treatment or processing of any such product or part;

(e) Thorium contained in finished optical lenses if each lens contains thirty percent or less by weight of thorium. The

exemption contained in this subparagraph shall not be deemed to authorize either:

(i) The shaping, grinding or polishing of lens or manufacturing processes other than the assembly of such lens into optical systems and devices without alteration of the lens; or

(ii) The receipt, possession, use or transfer of thorium contained in contact lenses, or in spectacles, or in eyepieces in binoculars or other optical instruments;

(f) Uranium contained in detector heads for use in fire detection units if each detector head contains 185 becquerels (0.005 microcuries) or less of uranium; or

(g) Thorium contained in any finished aircraft engine part containing nickel-thoria alloy if:

(i) The thorium is dispersed in the nickel-thoria alloy in the form of finely divided thoria (thorium dioxide); and

(ii) The thorium content in the nickel-thoria alloy is four percent or less by weight.

(4) The exemptions in subsection (3) of this section do not authorize the manufacture of any of the products described.

AMENDATORY SECTION (Amending WSR 01-02-068, filed 12/29/00, effective 1/29/01)

WAC 246-232-008 Exemption of certain timepieces, hands or dials. A person is exempt from these regulations to the extent the person receives, possesses, uses, transfers, owns or acquires, and does not apply radioactive material to, or incorporate radioactive material into, the following timepieces or hands or dials containing the following specified quantities of radioactive material and the following specified levels of radiation*:

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

(1)(a) 925 megabecquerels (25 millicuries) or less of tritium per timepiece;

(b) 185 megabecquerels (5 millicuries) or less of tritium per hand;

(c) 555 megabecquerels (15 millicuries) or less of tritium per dial (bezels when used shall be considered as part of the dial);

(d) 3.7 megabecquerels (100 microcuries) or less of promethium-147 per watch or 7.4 megabecquerels (200 microcuries) or less of promethium-147 per any other timepiece;

(e) 740 kilobecquerels (20 microcuries) or less of promethium-147 per watch hand or 1.48 megabecquerels (40 microcuries) or less of promethium-147 per other timepiece hand;

(f) 2.22 megabecquerels (60 microcuries) or less of promethium-147 per watch dial or 4.44 megabecquerels (120 microcuries) or less of promethium-147 per other timepiece dial

(bezels when used shall be considered as part of the dial);

(2) 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, 1 microgray (0.1 millirad) per hour at 10 centimeters from any surface;

(b) For pocket watches, 1 microgray (0.1 millirad) per hour at 1 centimeter from any surface;

(c) For any other timepiece, 2 micrograys (0.2 millirad) per hour at 10 centimeters from any surface.

(3) ((~~One~~)) 37 kilobecquerels (1 microcurie) of radium-226 per timepiece in timepieces manufactured prior to the effective date of these regulations.

AMENDATORY SECTION (Amending WSR 01-02-068, filed 12/29/00, effective 1/29/01)

WAC 246-232-009 Exemption of certain items containing radioactive material. A person is exempt from these regulations to the extent the person receives, possesses, uses, transfers, owns or acquires, and does not apply radioactive material to, or incorporate radioactive material into, the following products:*

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

(1) Lock illuminators containing 555 megabecquerels (15 millicuries) or less of tritium or 74 megabecquerels (2 millicuries) or less of promethium-147 installed in automobile locks. The levels of radiation from each lock illuminator containing promethium-147 will not exceed 10 micrograys (1 millirad) per hour at 1 centimeter from any surface when measured through 50 milligrams per square centimeter of absorber.

(2) Precision balances containing 37 megabecquerels (1 millicurie) or less of tritium per balance or 18.5 megabecquerels (0.5 millicurie) or less of tritium per balance part.

(3) Automobile shift quadrants containing 925 megabecquerels (25 millicuries) or less of tritium.

(4) Marine compasses containing 27.8 gigabecquerels (750 millicuries) or less of tritium gas and other marine navigational instruments containing 9.25 gigabecquerels (250 millicuries) or less of tritium gas.

(5) Thermostat dials and pointers containing 925 megabecquerels (25 millicuries) or less of tritium per thermostat.

(6) Electron tubes* if each tube contains no more than one of the following specified quantities of radioactive material and the levels of radiation from each electron tube do not exceed 10 micrograys (1 millirad) per hour at 1 centimeter from any surface

when measured through 7 milligrams per square centimeter of absorber:

(a) 5.55 gigabecquerels (150 millicuries) or less of tritium per microwave receiver protector tube or 370 megabecquerels (10 millicuries) or less of tritium per any other electron tube;

(b) 37 kilobecquerels (1 microcurie) or less of cobalt-60;

(c) 185 kilobecquerels (5 microcuries) or less of nickel-63;

(d) 1.11 megabecquerels (30 microcuries) or less of krypton-85;

(e) 185 kilobecquerels (5 microcuries) or less of cesium-137;

(f) 1.11 megabecquerels (30 microcuries) or less of promethium-147;

(g) 37 kilobecquerels (1 microcurie) or less of radium-226:

*Note: For purposes of this subdivision, "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.

(7) Ionizing radiation measuring instruments containing, for purposes of internal calibration or standardization, one or more but not to exceed 10 exempt sources of radioactive material.

(a) Each individual source shall not exceed 1.85 kilobecquerels (0.05 microcuries) of americium-241 or the applicable exempt quantity set forth in WAC 246-232-120, Schedule B.

(b) An individual source may contain more than one radionuclide but the total quantity in the individual source shall not exceed unity based on the sum of the fractional parts of one or more of the exempt quantities set forth in WAC 246-232-120, Schedule B. For purposes of this subsection, 1.85 kilobecquerels (0.05 microcuries) of americium-241 is considered an exempt quantity.

(8) Spark gap irradiators containing 37 kilobecquerels (1 microcurie) or less 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.

AMENDATORY SECTION (Amending WSR 01-02-068, filed 12/29/00, effective 1/29/01)

WAC 246-232-011 Exemption of certain self-luminous products containing radioactive material(s). (1) Tritium, krypton-85 or promethium-147. A person is exempt from these regulations to the extent that the person receives, possesses, uses, transfers, owns or acquires, and does not manufacture, process, produce, or initially transfer for sale or distribution, self-luminous products containing tritium, krypton-85 or promethium-147 in self-luminous products manufactured, processed, produced, imported or initially transferred in accordance with a specific license issued by the United States Nuclear Regulatory Commission under Section 32.22 of

10 C.F.R. Part 32, which license authorizes the transfer of the product to persons who are exempt from regulatory requirements. The exemption in this subsection does not apply to tritium, krypton-85 or promethium-147 used in products primarily for frivolous purposes or in toys or adornments.

(2) Radium-226. A person is exempt from these regulations to the extent that the person receives, possesses, uses, transfers or owns articles containing less than 3.7 kilobecquerels (0.1 microcurie) of radium-226 which were manufactured prior to October 1983.

AMENDATORY SECTION (Amending WSR 01-02-068, filed 12/29/00, effective 1/29/01)

WAC 246-232-120 Schedule B, exempt quantities of radioactive materials. (See also WAC 246-232-010(2).)

Radioactive Material	Microcuries
Antimony-122 (Sb-122)	100
Antimony-124 (Sb-124)	10
Antimony-125 (Sb-125)	10
Arsenic-73 (As-73)	100
Arsenic-74 (As-74)	10
Arsenic-76 (As-76)	10
Arsenic-77 (As-77)	100
Barium-131 (Ba-131)	10
Barium-133 (Ba-133)	10
Barium-140 (Ba-140)	10
Bismuth-210 (Bi-210)	1
Bromine-82 (Br-82)	10
Cadmium-109 (Cd-109)	10
Cadmium-115m (Cd-115m)	10
Cadmium-115 (Cd-115)	100
Calcium-45 (Ca-45)	10
Calcium-47 (Ca-47)	10
Carbon-14 (C-14)	100
Cerium-141 (Ce-141)	100
Cerium-143 (Ce-143)	100
Cerium-144 (Ce-144)	1
Cesium-129 (Cs-129)	100
Cesium-131 (Cs-131)	1,000
Cesium-134m (Cs-134m)	100
Cesium-134 (Cs-134)	1
Cesium-135 (Cs-135)	10
Cesium-136 (Cs-136)	10

Radioactive Material	Microcuries
Cesium-137 (Cs-137)	10
Chlorine-36 (Cl-36)	10
Chlorine-38 (Cl-38)	10
Chromium-51 (Cr-51)	1,000
Cobalt-57 (Co-57)	100
Cobalt-58m (Co-58m)	10
Cobalt-58 (Co-58)	10
Cobalt-60 (Co-60)	1
Copper-64 (Cu-64)	100
Dysprosium-165 (Dy-165)	10
Dysprosium-166 (Dy-166)	100
Erbium-169 (Er-169)	100
Erbium-171 (Er-171)	100
Europium-152 (Eu-152) 9.2h	100
Europium-152 (Eu-152) 13 yr	1
Europium-154 (Eu-154)	1
Europium-155 (Eu-155)	10
Fluorine-18 (F-18)	1,000
Gadolinium-153 (Gd-153)	10
Gadolinium-159 (Gd-159)	100
Gallium-67 (Ga-67)	100
Gallium-72 (Ga-72)	10
Germanium-68 (Ge-68)	10
Germanium-71 (Ge-71)	100
Gold-195 (Au-195)	10
Gold-198 (Au-198)	100
Gold-199 (Au-199)	100
Hafnium-181 (Hf-181)	10
Holmium-166 (Ho-166)	100
Hydrogen-3 (H-3)	1,000
Indium-111 (In-111)	100
Indium-113m (In-113m)	100
Indium-114m (In-114m)	10
Indium-115m (In-115m)	100
Indium-115 (In-115)	10
Iodine-123 (I-123)	100
Iodine-125 (I-125)	1
Iodine-126 (I-126)	1
Iodine-129 (I-129)	0.1
Iodine-131 (I-131)	1
Iodine-132 (I-132)	10
Iodine-133 (I-133)	1
Iodine-134 (I-134)	10
Iodine-135 (I-135)	10
Iridium-192 (Ir-192)	10

Radioactive Material	Microcuries
Iridium-194 (Ir-194)	100
Iron-52 (Fe-52)	10
Iron-55 (Fe-55)	100
Iron-59 (Fe-59)	10
Krypton-85 (Kr-85)	100
Krypton-87 (Kr-87)	10
Lanthanum-140 (La-140)	10
Lutetium-177 (Lu-177)	100
Manganese-52 (Mn-52)	10
Manganese-54 (Mn-54)	10
Manganese-56 (Mn-56)	10
Mercury-197m (Hg-197m)	100
Mercury-197 (Hg-197)	100
Mercury-203 (Hg-203)	10
Molybdenum-99 (Mo-99)	100
Neodymium-147 (And-147)	100
Neodymium-149 (And-149)	100
Nickel-59 (Ni-59)	100
Nickel-63 (Ni-63)	10
Nickel-65 (Ni-65)	100
Niobium-93m (Nb-93m)	10
Niobium-95 (Nb-95)	10
Niobium-97 (Nb-97)	10
Osmium-185 (So-185)	10
Osmium-191m (So-191m)	100
Osmium-191 (So-191)	100
Osmium-193 (So-193)	100
Palladium-103 (Pd-103)	100
Palladium-109 (Pd-109)	100
Phosphorus-32 (P-32)	10
Platinum-191 (Pt-191)	100
Platinum-193m (Pt-193m)	100
Platinum-193 (Pt-193)	100
Platinum-197m (Pt-197m)	100
Platinum-197 (Pt-197)	100
Polonium-210 (Po-210)	0.1
Potassium-42 (K-42)	10
Potassium-43 (K-43)	10
Praseodymium-142 (Pr-142)	100
Praseodymium-143 (Pr-143)	100
Promethium-147 (Pm-147)	10
Promethium-149 (Pm-149)	10
Radium-226 (Ra-226)	0.1
Rhenium-186 (Re-186)	100
Rhenium-188 (Re-188)	100

Radioactive Material	Microcuries
Rhodium-103m (Rh-103m)	100
Rhodium-105 (Rh-105)	100
Rubidium-81 (Rb-81)	10
Rubidium-86 (Rb-86)	10
Rubidium-87 (Rb-87)	10
Ruthenium-97 (Ru-97)	100
Ruthenium-103 (Ru-103)	10
Ruthenium-105 (Ru-105)	10
Ruthenium-106 (Ru-106)	1
Samarium-151 (Sm-151)	10
Samarium-153 (Sm-153)	100
Scandium-46 (Sc-46)	10
Scandium-47 (Sc-47)	100
Scandium-48 (Sc-48)	10
Selenium-75 (Se-75)	10
Silicon-31 (Is-31)	100
Silver-105 (Ag-105)	10
Silver-110m (Ag-110m)	1
Silver-111 (Ag-111)	100
Sodium-22 (Na-22)	10
Sodium-24 (Na-24)	10
Strontium-85 (Sr-85)	10
Strontium-89 (Sr-89)	1
Strontium-90 (Sr-90)	0.1
Strontium-91 (Sr-91)	10
Strontium-92 (Sr-92)	10
Sulphur-35 (S-35)	100
Tantalum-182 (Ta-182)	10
Technetium-96 (Tc-96)	10
Technetium-97m (Tc-97m)	100
Technetium-97 (Tc-97)	100
Technetium-99m (Tc-99m)	100
Technetium-99 (Tc-99)	10
Tellurium-125m (Te-125m)	10
Tellurium-127m (Te-127m)	10
Tellurium-127 (Te-127)	100
Tellurium-129m (Te-129m)	10
Tellurium-129 (Te-129)	100
Tellurium-131m (Te-131m)	10
Tellurium-132 (Te-132)	10
Terbium-160 (Tb-160)	10
Thallium-200 (Tl-200)	100
Thallium-201 (Tl-201)	100
Thallium-202 (Tl-202)	100
Thallium-204 (Tl-204)	10

Radioactive Material	Microcuries
Thulium-170 (Tm-170)	10
Thulium-171 (Tm-171)	10
Tin-113 (Sn-113)	10
Tin-125 (Sn-125)	10
Tungsten-181 (W-181)	10
Tungsten-185 (W-185)	10
Tungsten-187 (W-187)	100
Vanadium-48 (V-48)	10
Xenon-131m (Xe-131m)	1,000
Xenon-133 (Xe-133)	100
Xenon-135 (Xe-135)	100
Ytterbium-169 (Yb-169)	10
Ytterbium-175 (Yb-175)	100
Yttrium-87 (Y-87)	10
Yttrium-88 (Y-88)	10
Yttrium-90 (Y-90)	10
Yttrium-91 (Y-91)	10
Yttrium-92 (Y-92)	100
Yttrium-93 (Y-93)	100
Zinc-65 (Zn-65)	10
Zinc-69m (Zn-69m)	100
Zinc-69 (Zn-69)	1,000
Zirconium-93 (Zr-93)	10
Zirconium-95 (Zr-95)	10
Zirconium-97 (Zr-97)	10
Any radioactive material not listed above other than alpha emitting radioactive material	0.1

AMENDATORY SECTION (Amending Order 121, filed 12/27/90, effective 1/31/91)

WAC 246-232-140 Schedule D.

ACCEPTABLE SURFACE CONTAMINATION LEVELS

NUCLIDES A	AVERAGE B C F	MAXIMUM B D F	REMOVABLE B E F WIPE LIMITS
U-nat, U-235, U-238, and associated decay products	5,000 dpm ((α))/100 cm((²))	15,000 dpm ((α))/100 cm((²))	1,000 dpm α/100 cm((²))
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm((²))	300 dpm/100 cm((²))	20 dpm/100 cm((²))

NUCLIDES A	AVERAGE B C F	MAXIMUM B D F	REMOVABLE B E F WIPE LIMITS
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1000 dpm/100 cm(~~(2)~~ 2)	3000 dpm/100 cm(~~(2)~~ 2)	200 dpm/100 cm(~~(2)~~ 2)
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except SR-90 and others noted above	5000 dpm (~~(βγ)~~)/100 cm(~~(2)~~ 2)	15,000 dpm (~~(βγ)~~)/100 cm(~~(2)~~ 2)	1000 dpm βγ/100 cm(~~(2)~~ 2)

A Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

B As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

C Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

D The maximum contamination level applies to an area of not more than 100 cm^2.

E The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

F The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber.