Regulation

Of the Nuclear Regulatory Authority of the Slovak Republic

of 6 July 2015

Establishing a List of Radioactive Materials, Their Quantities and Their Physical and Chemical Parameters Justifying the Low Risk of Nuclear Damage

Nuclear Regulatory Authority of the Slovak Republic pursuant to Section 5, par.6 of the Act No. 54/2015 Coll. on civil liability for nuclear damage and its financial coverage and on amendments to certain laws (hereinafter only as the "Act") provides:

Section 1

This Regulation lays down the list, thee quantities and physical and chemical parameters of radioactive materials justifying the low risk of nuclear damage

a) during their transport; or
b) in the nuclear installation during the decommissioning phase, if there are nuclear materials or radioactive waste in such quantities and with such physical and chemical parameters and if fresh nuclear fuel or spent nuclear fuel is not present at the same time in such nuclear installation.

Section 2

(1) Excluded from liability for nuclear damage pursuant to Section 4 of the Act and from the obligation to financially cover this liability pursuant to Section 6 of the Act during the transport of radioactive materials are:

a) Radioactive material containing a single radionuclide with a total activity of less than one hundred times the value of A_2 per one conveyance, where A_2 is the value of activity of the relevant radionuclide pursuant to Annex 1; as one conveyance shall be regarded also a set of individual conveyances, if connected during transport,

b) Radioactive material containing a mixture of radionuclides, where the identity and the activity are known, where the resulting activity for a single conveyance is determined on the basis of a calculation using the formula

$$\sum_i \frac{B(i)}{100 \times A_2(i)} < 1$$

Where:

B(i) is the activity of the radionuclide (i) contained in the radioactive material; and

A_2(i) is the value of activity A_2 of the relevant radionuclide (i) according to Annex 1; as one conveyance shall be regarded also a set of individual conveyances, if connected during transport,

c) Radioactive material containing unknown radionuclide or unknown mixture of nuclides, or for which relevant data are not available, and for one conveyance the formula according to sub-par. b) applies with the A_2 values pursuant to Annex 2; as one conveyance shall be regarded also a set of individual conveyances, if connected during transport,

d) Special fissile material, which may be shipped as a standard package, under the conditions that the material:

1. is Uranium enriched in ^{235}U to a maximum of 1 % by mass and with a total Pu and ^{233}U content not exceeding 1 % of the mass of ^{235}U, distributed essentially homogeneously throughout the material, and if ^{235}U is present in metallic, oxide or carbide forms, it shall not form a lattice arrangement,
2. are liquid solutions of uranyl nitrate enriched in uranium ^{235}U to a maximum of 2 % by mass, with a total Pu and ^{233}U content not exceeding 0.002 % of the mass of uranium and with a minimum nitrogen to uranium atomic ratio (N/U) of 2,
3. is uranium with a maximum uranium enrichment of 5 % by mass of ^{235}U provided:

   3a. There is no more than 3.5 g of ^{235}U per package,

   3b. The total Pu and ^{233}U content does not exceed 1 % of the mass of ^{235}U per package,

   3c. Transport of the package does not exceed 45 g of fissile radionuclides,
4. is fissile radionuclide with a total mass not exceeding 2 g per consignment provided that the consignment does not exceed 15 g fissile nuclides,
5. is packaged or unpackaged fissile radionuclide with a total mass not exceeding 45 g per consignment, which must be transported under exclusive use of consignment not exceeding 45 g of fissile radionuclides, or
6. is a single fissile material permitted for the whole consignment, if authorization for shipment does not contain variety of materials.

(2) An installation in the process of being decommissioned is excluded from liability for nuclear damage under Section 4 of the Act and from the obligation to financially cover this liability under Section 6 of the Act, if the conditions pursuant to Section 5 par.5 sub-par. b) of the Act are met, and in the case of,

a) an installation containing several (n) of the isotopes pursuant to Annex 3 in the form of fixed activity (f) or any other form of activity (of), and

b) these activities of different isotopes present in the nuclear installation (Ai) jointly meet the criteria:

c)

$$\sum_{i=1 \text{ to n}} \left(\frac{A_{i\,of}}{A_{i\,of\,\text{lim}}} + \frac{A_{i\,f}}{A_{i\,f\,\text{lim}}} \right) \leq 1$$

Ai $_{\text{of lim}}$ is the limit activity for isotope (i) present in any other form than fixed activity, and $A_{\text{i f lim}}$ is the limit activity for isotope (i) present in the form of fixed activity.

Section 3

This Regulation shall enter into force on January 1, 2016.

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Basic radionuclide values (A_2)

Radionuclide (atomic number)	A_2 [TBq]
1	2
Actinium (89)	
Ac-225 (a)	6×10^{-3}
Ac-227 (a)	9×10^{-5}
Ac-228	5×10^{-1}
Silver (47)	
Ag-105	2×10^{0}
Ag-108m (a)	7×10^{-1}
Ag-110m (a)	4×10^{-1}
Ag-111	6×10^{-1}
Aluminium (13)	
Al-26	1×10^{-1}
Americium (95)	
Am-241	1×10^{-3}
Am-242m (a)	1×10^{-3}
Am-243 (a)	1×10^{-3}
Argon (18)	
Ar-37	4×10^{1}
Ar-39	2×10^{1}
Ar-41	3×10^{-1}
Arsenic (33)	
As-72	3×10^{-1}
As-73	4×10^{1}
As-74	9×10^{-1}
As-76	3×10^{-1}
As-77	7×10^{-1}
Astatine (85)	
At-211 (a)	5×10^{-1}
Gold (79)	
Au-193	2×10^{0}
Au-194	1×10^{0}
Au-195	6×10^{0}
Au-198	6×10^{-1}
Au-199	6×10^{-1}
Barium (56)	
Ba-131 (a)	2×10^{0}
Ba-133	3×10^{0}
Ba-133m	6×10^{-1}
Ba-140 (a)	3×10^{-1}
Beryllium (4)	
Be-7	2×10^{1}
Be-10	6×10^{-1}
Bismuth (83)	
Bi-205	7×10^{-1}
Bi-206	3×10^{-1}
Bi-207	7×10^{-1}
Bi-210	6×10^{-1}

Bi-210m (a)	2×10^{-2}
Bi-212 (a)	6×10^{-1}
Berkelium (97)	
Bk-247	8×10^{-4}
Bk-249 (a)	3×10^{-1}
Bromine (35)	
Br-76	4×10^{-1}
Br-77	3×10^{0}
Br-82	4×10^{-1}
Carbon (6)	
C-11	6×10^{-1}
C-14	3×10^{0}
Calcium (20)	
Ca-41	Unlimited
Ca-45	1×10^{0}
Ca-47 (a)	3×10^{-1}
Cadmium (48)	
Cd-109	2×10^{0}
Cd-113m	5×10^{-1}
Cd-115 (a)	4×10^{-1}
Cd-115m	5×10^{-1}
Cerium (58)	
Ce-139	2×10^{0}
Ce-141	6×10^{-1}
Ce-143	6×10^{-1}
Ce-144 (a)	2×10^{-1}
Californium (98)	
Cf-248	6×10^{-3}
Cf-249	8×10^{-4}
Cf-250	2×10^{-3}
Cf-251	7×10^{-4}
Cf-252	3×10^{-3}
Cf-253 (a)	4×10^{-2}
Cf-254	1×10^{-3}
Chlorine (17)	
Cl-36	6×10^{-1}
Cl-38	2×10^{-1}
Curium (96)	
Cm-240	2×10^{-2}
Cm-241	1×10^{0}
Cm-242	1×10^{-2}
Cm-243	1×10^{-3}
Cm-244	2×10^{-3}
Cm-245	9×10^{-4}
Cm-246	9×10^{-4}
Cm-247 (a)	1×10^{-3}
Cm-248	3×10^{-4}
Cobalt (27)	
Co-55	5×10^{-1}
Co-56	3×10^{-1}
Co-57	1×10^{1}
Co-58	1×10^{0}
Co-58m	4×10^{1}

Co-60	4×10^{-1}
Chromium (24)	
Cr-51	3×10^{1}
Ceasium (55)	
Cs-129	4×10^{0}
Cs-131	3×10^{1}
Cs-132	1×10^{0}
Cs-134	7×10^{-1}
Cs-134m	6×10^{-1}
Cs-135	1×10^{0}
Cs-136	5×10^{-1}
Cs-137 (a)	6×10^{-1}
Copper (29)	
Cu-64	1×10^{0}
Cu-67	7×10^{-1}
Dysprosium (66)	
Dy-159	2×10^{1}
Dy-165	6×10^{-1}
Dy-166 (a)	3×10^{-1}
Erbium (68)	
Er-169	1×10^{0}
Er-171	5×10^{-1}
Europium (63)	
Eu-147	2×10^{0}
Eu-148	5×10^{-1}
Eu-149	2×10^{1}
Eu-150 (short lived)	7×10^{-1}
Eu-150 (long lived)	7×10^{-1}
Eu-152	1×10^{0}
Eu-152m	8×10^{-1}
Eu-154	6×10^{-1}
Eu-155	3×10^{0}
Eu-156	7×10^{-1}
Fluorine (9)	
F-18	6×10^{-1}
Iron (26)	
Fe-52 (a)	3×10^{-1}
Fe-55	4×10^{1}
Fe-59	9×10^{-1}
Fe-60 (a)	2×10^{-1}
Gallium (31)	
Ga-67	3×10^{0}
Ga-68	5×10^{-1}
Ga-72	4×10^{-1}
Gadolinium (64)	
Gd-146 (a)	5×10^{-1}
Gd-148	2×10^{-3}
Gd-153	9×10^{0}
Gd-159	6×10^{-1}
Germanium (32)	
Ge-68 (a)	5×10^{-1}
Ge-71	4×10^{1}
Ge-77	3×10^{-1}

Hafnium (72)	
Hf-172 (a)	6×10^{-1}
Hf-175	3×10^{0}
Hf-181	5×10^{-1}
Hf-182	Unlimited
Mercury (80)	
Hg-194 (a)	1×10^{0}
Hg-195m (a)	7×10^{-1}
Hg-197	1×10^{1}
Hg-197m	4×10^{-1}
Hg-203	1×10^{0}
Holmium (67)	
Ho-166	4×10^{-1}
Ho-166m	5×10^{-1}
Iodine (53)	
I-123	3×10^{0}
I-124	1×10^{0}
I-125	3×10^{0}
I-126	1×10^{0}
I-129	Unlimited
I-131	7×10^{-1}
I-132	4×10^{-1}
I-133	6×10^{-1}
I-134	3×10^{-1}
I-135 (a)	6×10^{-1}
Indium (49)	
In-111	3×10^{0}
In-113m	2×10^{0}
In-114m (a)	5×10^{-1}
In-115m	1×10^{0}
Iridium (77)	
Ir-189 (a)	1×10^{1}
Ir-190	7×10^{-1}
Ir-192	6×10^{-1}
Ir-194	3×10^{-1}
Potassium (19)	
K-40	9×10^{-1}
K-42	2×10^{-1}
K-43	6×10^{-1}
Krypton (36)	
Kr-79	2×10^{0}
Kr-81	4×10^{1}
Kr-85	1×10^{1}
Kr-85m	3×10^{0}
Kr-87	2×10^{-1}
Lanthanum (57)	
La-137	6×10^{0}
La-140	4×10^{-1}
Lutetium (71)	
Lu-172	6×10^{-1}
Lu-173	8×10^{0}
Lu-174	9×10^{0}
Lu-174m	1×10^{1}

Lu-177	7×10^{-1}
Magnesium (12)	
Mg-28 (a)	3×10^{-1}
Manganese (25)	
Mn-52	3×10^{-1}
Mn-53	Unlimited
Mn-54	1×10^{0}
Mn-56	3×10^{-1}
Molybdenum (42)	
Mo-93	2×10^{1}
Mo-99(a)	6×10^{-1}
Nitrogen (7)	
N-13	6×10^{-1}
Sodium (11)	
Na-22	5×10^{-1}
Na-24	2×10^{-1}
Niobium (41)	
Nb-93m	3×10^{1}
Nb-94	7×10^{-1}
Nb-95	1×10^{0}
Nb-97	6×10^{-1}
Neodymium (60)	
Nd-147	6×10^{-1}
Nd-149	5×10^{-1}
Nickel (28)	
Ni-59	Unlimited
Ni-63	3×10^{1}
Ni-65	4×10^{-1}
Neptunium (93)	
Np-235	4×10^{1}
Np-236 (short lived)	2×10^{0}
Np-236 (long lived)	2×10^{-2}
Np-237	2×10^{-3}
Np-239	4×10^{-1}
Osmium (76)	
Os-185	1×10^{0}
Os-191	2×10^{0}
Os-191m	3×10^{1}
Os-193	6×10^{-1}
Os-194 (a)	3×10^{-1}
Phosphorus (15)	
P-32	5×10^{-1}
P-33	1×10^{0}
Protactinium (91)	
Pa-230 (a)	7×10^{-2}
Pa-231	4×10^{-4}
Pa-233	7×10^{-1}
Lead (82)	
Pb-201	1×10^{0}
Pb-202	2×10^{1}
Pb-203	3×10^{0}
Pb-205	Unlimited
Pb-210 (a)	5×10^{-2}

Pb-212 (a)	2×10^{-1}
Palladium (46)	
Pd-103 (a)	4×10^{1}
Pd-107	Unlimited
Pd-109	5×10^{-1}
Promethium (61)	
Pm-143	3×10^{0}
Pm-144	7×10^{-1}
Pm-145	1×10^{1}
Pm-147	2×10^{0}
Pm-148m (a)	7×10^{-1}
Pm-149	6×10^{-1}
Pm-151	6×10^{-1}
Polonium (84)	
Po-210	2×10^{-2}
Praseodymium (59)	
Pr-142	4×10^{-1}
Pr-143	6×10^{-1}
Platinum (78)	
Pt-188 (a)	8×10^{-1}
Pt-191	3×10^{0}
Pt-193	4×10^{1}
Pt-193m	5×10^{-1}
Pt-195m	5×10^{-1}
Pt-197	6×10^{-1}
Pt-197m	6×10^{-1}
Plutonium (94)	
Pu-236	3×10^{-3}
Pu-237	2×10^{1}
Pu-238	1×10^{-3}
Pu-239	1×10^{-3}
Pu-240	1×10^{-3}
Pu-241 (a)	6×10^{-2}
Pu-242	1×10^{-3}
Pu-244 (a)	1×10^{-3}
Radium (88)	
Ra-223 (a)	7×10^{-3}
Ra-224 (a)	2×10^{-2}
Ra-225 (a)	4×10^{-3}
Ra-226 (a)	3×10^{-3}
Ra-228 (a)	2×10^{-2}
Rubidium (37)	
Rb-81	8×10^{-1}
Rb-83 (a)	2×10^{0}
Rb-84	1×10^{0}
Rb-86	5×10^{-1}
Rb-87	Unlimited
Rb (natural)	Unlimited
Rhenium (75)	
Re-184	1×10^{0}
Re (natural)	Unlimited
Re-184m	1×10^{0}
Re-186	6×10^{-1}

Re-187	Unlimited
Re-188	4×10^{-1}
Re-189 (a)	6×10^{-1}
Rhodium (45)	
Rh-99	2×10^{0}
Rh-101	3×10^{0}
Rh-102	5×10^{-1}
Rh-102m	2×10^{0}
Rh-103m	4×10^{1}
Rh-105	8×10^{-1}
Radon (86)	
Rn-222 (a)	4×10^{-3}
Ruthenium (44)	
Ru-97	5×10^{0}
Ru-103 (a)	2×10^{0}
Ru-105	6×10^{-1}
Ru-106 (a)	2×10^{-1}
Síra (16)	
S-35	3×10^{0}
Antimony (51)	
Sb-122	4×10^{-1}
Sb-124	6×10^{-1}
Sb-125	1×10^{0}
Sb-126	4×10^{-1}
Scandium (21)	
Sc-44	5×10^{-1}
Sc-46	5×10^{-1}
Sc-47	7×10^{-1}
Sc-48	3×10^{-1}
Selenium (34)	
Se-75	3×10^{0}
Se-79	2×10^{0}
Silicon (14)	
Si-31	6×10^{-1}
Si-32	5×10^{-1}
Samarium (62)	
Sm-145	1×10^{1}
Sm-147	Unlimited
Sm-151	1×10^{1}
Sm-153	6×10^{-1}
Tin (50)	
Sn-113 (a)	2×10^{0}
Sn-117m	4×10^{-1}
Sn-119m	3×10^{1}
Sn-121m (a)	9×10^{-1}
Sn-123	6×10^{-1}
Sn-125	4×10^{-1}
Sn-126 (a)	4×10^{-1}
Strontium (38)	
Sr-82 (a)	2×10^{-1}
Sr-85	2×10^{0}
Sr-85m	5×10^{0}
Sr-87m	3×10^{0}

Sr-89	6×10^{-1}
Sr-90 (a)	3×10^{-1}
Sr-91 (a)	3×10^{-1}
Sr-92 (a)	3×10^{-1}
Tritium (1)	
T (H-3)	4×10^{1}
Tantalum (73)	
Ta-178 (long lived)	8×10^{-1}
Ta-179	3×10^{1}
Ta-182	5×10^{-1}
Terbium (65)	
Tb-157	4×10^{1}
Tb-158	1×10^{0}
Tb-160	6×10^{-1}
Technetium (43)	
Tc-95m (a)	2×10^{0}
Tc-96	4×10^{-1}
Tc-96m (a)	4×10^{-1}
Tc-97	Unlimited
Tc-97m	1×10^{0}
Tc-98	7×10^{-1}
Tc-99	9×10^{-1}
Tc-99m	4×10^{0}
Tellurium (52)	
Te-121	2×10^{0}
Te-121m	3×10^{0}
Te-123m	1×10^{0}
Te-125m	9×10^{-1}
Te-127	7×10^{-1}
Te-127m (a)	5×10^{-1}
Te-129	6×10^{-1}
Te-129m (a)	4×10^{-1}
Te-131m (a)	5×10^{-1}
Te-132 (a)	4×10^{-1}
Thorium (90)	
Th-227	5×10^{-3}
Th-228 (a)	1×10^{-3}
Th-229	5×10^{-4}
Th-230	1×10^{-3}
Th-231	2×10^{-2}
Th-232	Unlimited
Th-234 (a)	3×10^{-1}
Th (natural)	Unlimited
Titanium (22)	
Ti-44 (a)	4×10^{-1}
Thallium (81)	
Tl-200	9×10^{-1}
Tl-201	4×10^{0}
Tl-202	2×10^{0}
Tl-204	7×10^{-1}
Thulium (69)	
Tm-167	8×10^{-1}
Tm-170	6×10^{-1}

Tm-171	4×10^{1}
Uranium (92)	
U-230 (fast lung absorption) (a), (d)	1×10^{-1}
U-230 (medium lung absorption) (a), (e)	4×10^{-3}
U-230 (slow lung absorption) (a), (f),	3×10^{-3}
U-232 (fast lung absorption) (d)	1×10^{-2}
U-232 (medium lung absorption) (e)	7×10^{-3}
U-232 (slow lung absorption) (f)	1×10^{-3}
U-233 (fast lung absorption) (d)	9×10^{-2}
U-233 (medium lung absorption) (e)	2×10^{-2}
U-233 (slow lung absorption) (f)	6×10^{-3}
U-234 (fast lung absorption) (d)	9×10^{-2}
U-234 (medium lung absorption) (e),	2×10^{-2}
U-234 (slow lung absorption) (f)	6×10^{-3}
U-235 ((all lung absorption types) (a), (d), (e), (f)	Unlimited
U-236 (fast lung absorption) (d)	Unlimited
U-236 (medium lung absorption) (e)	2×10^{-2}
U-236 (slow lung absorption) (f),	6×10^{-3}
U-238 (all lung absorption types) (d), (e), (f)	Unlimited
U (natural)	Unlimited
U (ochudobnený)	Unlimited
U (enriched to 20% or less) (g)	Unlimited
Vanadium (23)	
V-48	4×10^{-1}
V-49	4×10^{1}
Tungsten (74)	
W-178 (a)	5×10^{0}
W-181	3×10^{1}
W-185	8×10^{-1}
W-187	6×10^{-1}
W-188 (a)	3×10^{-1}
Xenon (54)	
Xe-122 (a)	4×10^{-1}
Xe-123	7×10^{-1}
Xe-127	2×10^{0}
Xe-131m	4×10^{1}

Xe-133	1×10^{1}
Xe-135	2×10^{0}
Yttrium (39)	
Y-87 (a)	1×10^{0}
Y-88	4×10^{-1}
Y-90	3×10^{-1}
Y-91	6×10^{-1}
Y-91m	2×10^{0}
Y-92	2×10^{-1}
Y-93	3×10^{-1}
Ytterbium (79)	
Yb-169	1×10^{0}
Yb-175	9×10^{-1}
Zinc (30)	
Zn-65	2×10^{0}
Zn-69	6×10^{-1}
Zn-69m (a)	6×10^{-1}
Zirconium (40)	
Zr-88	3×10^{0}
Zr-93	Unlimited
Zr-95 (a)	8×10^{-1}
Zr-97 (a)	4×10^{-1}

(a) A_2 values for these parent radionuclides include contributions from their progeny with half-lives less than 10 days, as listed in the following:

Mg-28	Al-28
Ar-42	K-42
Ca-47	Sc-47
Ti-44	Sc-44
Fe-52	Mn-52m
Fe-60	Co-60m
Zn-69m	Zn-69
Ge-68	Ga-68
Rb-83	Kr-83m
Sr-82	Rb-82
Sr-90	Y-90
Sr-91	Y-91m
Sr-92	Y-92
Y-87	Sr-87m
Zr-95	Nb-95m
Zr-97	Nb-97m, Nb-97
Mo-99	Tc-99m
Tc-95m	Tc-95
Tc-96m	Tc-96
Ru-103	Rh-103m
Ru-106	Rh-106
Pd-103	Rh-103m
Ag-108m	Ag-108
Ag-110m	Ag-110
Cd-115	In-115m
In-114m	In-114
Sn-113	In-113m
Sn-121m	Sn-121
Sn-126	Sb-126m
Te-118	Sb-118
Te-127m	Te-127

Te-129m	Te-129
Te-131m	Te-131
Te-132	I-132
I-135	Xe-135m
Xe-122	I-122
Cs-137	Ba-137m
Ba-131	Cs-131
Ba-140	La-140
Ce-144	Pr-144m, Pr-144
Pm-148m	Pm-148
Gd-146	Eu-146
Dy-166	Ho-166
Hf-172	Lu-172
W-178	Ta-178
W-188	Re-188
Re-189	Os-189m
Os-194	Ir-194
Ir-189	Os-189m
Pt-188	Ir-188
Hg-194	Au-194
Hg-195m	Hg-195
Pb-210	Bi-210
Pb-212	Bi-212, Tl-208, Po-212
Bi-210m	Tl-206
Bi-212	Tl-208, Po-212
At-211	Po-211
Rn-222	Po-218, Pb-214, At-218, Bi.-214, Po-214
Ra-223	Rn-219, Po-215, Pb-211, Bi-211, Po-211, Tl-207
Ra-224	Rn-220, Po-216, Pb-212, Bi-212, Tl-208, Po-212
Ra-225	Ac-225, Fr-221, At-217, Bi-213, Tl-209, Po-213, Pb-209
Ra-226	Rn-222, Po-218, Pb-214, At-218, Bi-214, Po-214
Ra-228	Ac-228
Ac-225	Fr-221, At-217, Bi-213, Tl-209, Po-213, Pb-209
Ac-227	Fr-223
Th-228	Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208, Po-212
Th-234	Pa-234m, Pa-234
Pa-230	Ac-226, Th-226, Fr-222, Rn-218, Po-214
U-230	Th-226, Ra-222, Rn-218, Po-214
U-235	Th-231
Pu-241	U-237
Pu-244	U-240, Np-240m
Am-242m	Am-242, Np-238
Am-243	Np-239
Cm-247	Pu-243
Bk-249	Am-245
Cf-253	Cm-249

(b) Parent nuclides and their progeny included in secular equilibrium are listed in the following:

Sr-90	Y-90,
Zr-93	Nb-93m,
Zr-97	Nb-97,
Ru-106	Rh-106,
Ag – 108m	Ag - 108
Cs-137	Ba-137m,
Ce-144	Pr-144
Ba – 140	La-140,
Bi-212	Tl-208 (0,36), Po-212 (0,64),
Pb-210	Bi-210, Po-210,
Pb-212	Bi-212, Tl-208 (0,36), Po-212 (0,64),
Rn-222	Po-218, Pb-214, Bi-214, Po-214,

Ra-223	Rn-219, Po-215, Pb-211, Bi-211, Tl-207,
Ra-224	Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0,36), Po-212 (0,64),
Ra-226	Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210,
Ra-228	Ac-228,
Th-228	Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0,36), Po-212 (0,64),
Th-229	Ra-225, Ac-225, Fr-221, At-217, Bi-213, Po-213, Pb-209,
Th-natural	Ra-228, Ac-228, Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0,36), Po-212 (0,64),
Th-234	Pa-234m,
U-230	Th-226, Ra-222, Rn-218, Po-214,
U-232	Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0,36), Po-212 (0,64),
U-235	Th-231,
U-238	Th-234, Pa-234m,
U-natural	Th-234, Pa-234m, U-234, Th-230, Ra-226, Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210,
Np-237	Pa-233,
Am-242m	Am-242,
Am-243	Np-239,

(c) - The quantity may be determined from a measurement of the rate of decay or a measurement of the radiation level at a prescribed distance from the source

(d) - These values apply only to compounds of uranium that take the chemical form of UF6, UO2F2 and UO2(NO3)2 in both normal and accident conditions of transport

(e) - These values apply only to compounds of uranium that take the chemical form of UO3, UF4, UCl4 and hexavalent compounds in both normal and accident conditions of transport

(f) - These values apply to all compounds of uranium other than those specified in (d) and (e) above

(g) - These values apply to unirradiated uranium only

Basic radionuclide values for unknown radionuclides or mixtures

Radioactive content	A_2 [TBq]
Only beta or gamma emitting nuclides are known to be present	2×10^{-2}
Alpha emitting nuclides, but no neutron emitters are known to be present	9×10^{-5}
Neutron emitting nuclides are known to be present or no relevant data are available	9×10^{-5}

Annex 3 to Regulation No. 170/2015 Coll.

Installation Activity Exclusion Criteria to Isotope

Isotope	Fixed activity (Bq)	All other forms of activity (Bq)
Pu^{239}	1 E+13	1 E+12
Pu^{241}	1 E+15	1 E+14
U^{238}	1 E+14	1 E+13
Cs^{137}	1 E+13	1 E+12
Ni^{63}	1 E+16	1 E+15
Co^{60}	1 E+14	1 E+13
Fe^{55}	1 E+16	1 E+15
Eu^{152}	1 E+14	1 E+13
Eu^{154}	1 E+14	1 E+13
Cl^{36}	1 E+12	
Sr^{90}	1 E+14	1 E+13
Ag^{108m}	1 E+13	1 E+12