1.1. **Annex I**

Reference levels for public exposure as referred to in Articles 7 and 101 of the Directive 2013/59/EUROATOM

1. Without prejudice to reference levels set for equivalent doses, reference levels expressed in effective doses shall be set in the range of 1 to 20 mSv per year for existing exposure situations and 20 to 100 mSv (acute or annual) for emergency exposure situations.

2. In specific situations, a reference level below ranges referred to in point 1 may be considered, in particular:

2.1. A reference level below 20 mSv may be set in an emergency exposure situation where appropriate protection can be provided without causing a disproportionate detriment from the corresponding countermeasures or an excessive cost;

2.2. A reference level below 1 mSv per year may be set, where appropriate, in an existing exposure situation for specific source-related exposures or pathways of exposure.

3. For the transition from an emergency exposure situation to an existing exposure situation, appropriate reference levels shall be set, in particular upon the termination of long-term countermeasures such as relocation.

4. The reference levels set shall take account of the features of prevailing situations as well as societal criteria, which may include the following:

4.1. For exposures below or equal to 1 mSv per year, general information on the level of exposure, without specific consideration of individual exposures;

4.2. In the range up to or equal to 20 mSv per year, specific information to enable individuals to manage their own exposure, if possible;

4.3. In the range up to or equal to 100 mSv per year, assessment of individual doses and specific information on radiation risks and on available actions to reduce exposures.

1.2. **Annex II**

Radiation and tissue weighting factors as referred to in points (25) and (33) of Article 4 of the Directive 2013/59/EUROATOM

A. ***Radiation weighting factors***

Radiation type	w_R
Photons	1
Electrons and muons	1
Protons and charged pions	2
Alpha particles, fission fragments, heavy ions	20
Neutrons, $E_n < 1$ MeV	$2{,}5 + 18{,}2\, e^{-[\ln(En)]^2/6}$
Neutrons, 1 MeV $\leq E_n \leq$ 50 MeV	$5{,}0 + 17{,}0\, e^{-[\ln(2\,En)]^2/6}$
Neutrons, $E_n >$ 50 MeV	$2{,}5 + 3{,}25\, e^{-[\ln(0{,}04\,En)]^2/6}$
Note: All values relate to the radiation incident on the body or, for internal radiation sources, emitted from the incorporated radionuclide(s).	

B. ***Tissue weighting factors***

Tissue	w_T
Bone-marrow (red)	0,12
Colon	0,12
Lung	0,12
Stomach	0,12
Breast	0,12
Remainder tissues (1)	0,12
Gonads	0,08
Bladder	0,04
Oesophagus	0,04
Liver	0,04
Thyroid	0,04
Bone surface	0,01
Brain	0,01
Salivary glands	0,01
Skin	0,01

(1) The w_T for the remainder tissues (0,12) applies to the arithmetic mean dose of the 13 organs and tissues for each sex listed below. Remainder tissues: adrenals, extrathoracic (ET) region, gall bladder, heart, kidneys, lymphatic nodes, muscle, oral mucosa, pancreas, prostate (male), small intestine, spleen, thymus, uterus/cervix (female).

1.3. **Annex III**

Activity values defining high-activity sealed sources as referred to in point (43) of Article 4 of the Directive 2013/59/EUROATOM

For radionuclides not listed in the table below, the relevant activity is identical to the D-value defined in the IAEA publication Dangerous quantities of radioactive material (D-values), (EPR-D-VALUES 2006).

Radionuclide	**Activity (TBq)**
Am-241	6×10^{-2}
Am-241/Be-9 (1)	6×10^{-2}
Cf-252	2×10^{-2}
Cm-244	5×10^{-2}
Co-60	3×10^{-2}
Cs-137	1×10^{-1}
Gd-153	1×10^{0}
Ir-192	8×10^{-2}
Pm-147	4×10^{1}
Pu-238	6×10^{-2}
Pu-239/Be-9 (1)	6×10^{-2}
Ra-226	4×10^{-2}
Se-75	2×10^{-1}
Sr-90 (Y-90)	1×10^{0}
Tm-170	2×10^{1}
Yb-169	3×10^{-1}

(1) The activity given is that of the alpha-emitting radionuclide

1.4. **ANNEX IV**

Justification of new classes or types of practices involving consumer products as referred to in Article 20 of the Directive 2013/59/EUROATOM

1.Any undertaking intending to manufacture or import consumer products for which the intended use is likely to lead to a new class or type of practice, shall provide the Agency with all relevant information, as to the:

1.1. Intended use of the product;

1.2. Technical characteristics of the product;

1.3. In the case of products containing radioactive substances, information as to their means of fixation;

1.4. Dose rates at relevant distances for the use of the product, including dose rates at a distance of 0,1 m from any accessible surface;

1.5. Expected doses to regular users of the product.

2. The Agency shall examine that information and in particular assess whether:

2.1. The performance of the consumer product justifies its intended use;

2.2. The design is adequate in order to minimize exposures in normal use and the likelihood and consequences of misuse or accidental exposures, or whether there should be conditions imposed on the technical and physical characteristics of the product;

2.3. The product is adequately designed to meet the exemption criteria, and, where applicable, is of an approved type and does not necessitate specific precautions for disposal when no longer in use;

2.4. The product is appropriately labelled and suitable documentation is provided to the consumer with instructions for proper use and disposal.

1.5. **ANNEX V**

Indicative list of practices involving non-medical imaging exposure as referred to in Article 22 of the Directive 2013/59/EUROATOM

1. Practices using medical radiological equipment:

    1.1. Radiological health assessment for employment purposes;

    1.2. Radiological health assessment for immigration purposes;

    1.3. Radiological health assessment for insurance purposes;

    1.4. Radiological evaluation of the physical development of children and adolescents with a view to a career in sports, dancing, etc.;

    1.5. Radiological age assessment;

    1.6. Use of ionizing radiation for the identification of concealed objects within the human body.

2. Practices not using medical radiological equipment:

    2.1. Use of ionizing radiation for detection of concealed objects on or attached to the human body;

    2.2. Use of ionizing radiation for detection of concealed humans as part of cargo screening;

    2.3. Practices involving the use of ionizing radiation for legal or security purposes.

1.6. **ANNEX VI**

List of industrial sectors involving naturally-occurring radioactive material as referred to in Article 23 of the Directive 2013/59/EUROATOM

1. When applying Article 15 of this regulation the following list of industrial sectors involving naturally-occurring radioactive material, including research and relevant secondary processes, shall be taken into account:

1.1. Extraction of rare earths from monazite;

1.2. Production of thorium compounds and manufacture of thorium-containing products;

1.3. Processing of niobium/tantalum ore;

1.4. Oil and gas production;

1.5. Geothermal energy production;

1.6. TiO2 pigment production;

1.7. Thermal phosphorus production;

1.8. Zircon and zirconium industry;

1.9. Production of phosphate fertilisers;

1.10. Cement production, maintenance of clinker ovens;

1.11. Coal-fired power plants, maintenance of boilers;

1.12. Phosphoric acid production;

1.13. Primary iron production;

1.14. Tin/lead/copper smelting;

1.15. Ground water filtration facilities;

1.16 Mining of ores other than uranium ore.

1.7. **Annex VII**

Exemption and clearance criteria as referred to in Articles 24, 26 and 30 of the Directive 2013/59/EUROATOM

1. Exemption

Practices may be exempted from notification either directly, on the basis of compliance with exemption levels (activity values (in Bq) or activity concentration values (in kBq kg-1)) laid down in Section 2 of the Directive 2013/59/EUROATOM., or on the basis of higher values that, for specific applications, are established by the Agency, satisfying the general exemption and clearance criteria set out in section 3 of the Directive 2013/59/EUROATOM.. Practices subject to notification may be exempted from authorisation by law or general administrative act, or through an ad-hoc regulatory decision, on the basis of the information provided in conjunction with the notification of the practice and in line with general exemption criteria set out in section 3.

2. Exemption and clearance levels

2.1. The total activity values (in Bq) for exemption apply to the total activity involved in a practice and are laid down in column 3 of Table B for artificial radionuclides and for some naturally-occurring radionuclides used in consumer products. For other practices involving naturally-occurring radionuclides, such values are, in general, not applicable.

2.2. The exempt activity concentration values (in kBq kg^{-1}) for the materials involved in the practice are laid down in Table A, Part 1, for artificial radionuclides, and in Table A, Part 2, for naturally-occurring radionuclides. The values in Table A, Part 1, are given for individual radionuclides, where applicable, including short-lived radionuclides in equilibrium with the parent nuclide, as indicated. The values in Table A, Part 2, apply to all radionuclides in the decay chain of U-238 or Th-232, but for segments of the decay chain, which are not in equilibrium with the parent radionuclide, higher values may be applied.

2.3. The concentration values in Table A, Part 1, or in Table A, Part 2, also apply to the clearance of solid materials for reuse, recycling, conventional disposal or incineration. Higher values may be defined for specific materials or specific pathways, taking Community guidance into account, including, where appropriate, additional requirements, in terms of surface activity or monitoring requirements.

2.4. For mixtures of artificial radionuclides, the weighted sum of nuclide-specific activities or concentrations (for various radionuclides contained in the same matrix) divided by the corresponding exemption value shall be less than unity. Where appropriate, this condition can be verified on the basis of best estimates of the composition of the radionuclide mix. The values in Table A, Part 2, apply individually to each parent nuclide. Some elements in the decay chain, e.g. Po-210 or Pb-210, may warrant the use of higher values taking Community guidance into account.

2.5. The values in Table A, Part 2, may not be used to exempt the incorporation into building materials of residues from industries processing naturally-occurring radioactive material. For this purpose, compliance with the provisions of Article 75

shall be verified. The values laid down in Table B, column 3, apply to the total inventory of radioactive substances held by a person or undertaking as part of a specific practice at any point in time. However, the Agency may apply these values to smaller entities or packages, for instance to exempt the transport or storage of exempted consumer products, if the general exemption criteria in section 3 are satisfied.

3. General exemption and clearance criteria

3.1. The general criteria for the exemption of practices from notification or authorisation or for the clearance of materials from authorised practices are as follows:

3.1.1. The radiological risks to individuals caused by the practice are sufficiently low, as to be of no regulatory concern; and

3.1.2. The type of practice has been determined to be justified; and

3.1.3. The practice is inherently safe.

3.2. Practices involving small amounts of radioactive substances or low activity concentrations, comparable to the exemption values laid down in Table A or Table B are deemed to fulfil criterion 3.1.3.

3.3. Practices involving amounts of radioactive substances or activity concentrations below the exemption values laid down in Table A, Part 1, or Table B, are deemed to comply with criterion 3.1.1. without further consideration. This is also the case for the values in Table A, Part 2, with the exception of the recycling of residues in building materials or the case of specific exposure pathways, for instance, drinking water

3.4. In the case of moderate amounts of material, as specified for specific types of practice, the activity concentration values laid down in Table B, column 2, may be used instead of the values laid down in Table A, Part 1, for the purpose of exemption from authorisation.

3.5. For the purpose of exemption from notification or for the purpose of clearance, where amounts of radioactive substances or activity concentrations do not comply with the values laid down in Table A or Table B, an assessment shall be made in the light of the general criteria 3.1.1 to 3.1.3 above. For compliance with the general criterion 3.1.1, it shall be demonstrated that workers should not be classified as exposed workers, and the following criteria for the exposure of members of the public are met in all feasible circumstances:

3.5.1. For artificial radionuclides: The effective dose expected to be incurred by a member of the public due to the exempted practice is of the order of 10 μSv or less in a year.

3.5.2. For naturally-occurring radionuclides: The dose increment, allowing for the prevailing background radiation from natural radiation sources, liable to be incurred by an individual due to the exempted practice is of the order of 1 mSv or less in a year. The assessment of doses to members of the public shall take

into account not only pathways of exposure through airborne or liquid effluent, but also pathways resulting from the disposal or recycling of solid residues. Member States may specify dose criteria lower than 1 mSv per year for specific types of practices or specific pathways of exposure.

3.6. For the purpose of exemption from authorisation, less restrictive dose criteria may be applied.

TABLE A
Activity concentration values for exemption or clearance of materials which can be applied by default to any amount and to any type of solid material

TABLE A PART 1
Artificial radionuclides

Radionuklid	**Activity concentration ($kBq\ kg^{-1}$)**
H-3	100
Be-7	10
C-14	1
F-18	10
Na-22	0,1
Na-24	1
Si-31	1 000
P-32	1 000
P-33	1 000
S-35	100
Cl-36	1
Cl-38	10
K-42	100
K-43	10
Ca-45	100
Ca-47	10
Sc-46	0,1
Sc-47	100
Sc-48	1
V-48	1
Cr-51	100
Mn-51	10
Mn-52	1
Mn-52 m	10
Mn-53	100
Mn-54	0,1
Mn-56	10

Fe-52 (1)	10
Fe-55	1 000
Fe-59	1
Co-55	10
Co-56	0,1
Co-57	1
Co-58	1
Co-58 m	10 000
Co-60	0,1
Co-60 m	1 000
Co-61	100
Co-62 m	10
Ni-59	100
Ni-63	100
Ni-65	10
Cu-64	100
Zn-65	0,1
Zn-69	1 000
Zn-69 m (1)	10
Ga-72	10
Ge-71	10 000
As-73	1 000
As-74	10
As-76	10
As-77	1 000
Se-75	1
Br-82	1
Rb-86	100
Sr-85	1
Sr-85 m	100
Sr-87 m	100
Sr-89	1 000
Sr-90 (1)	1
Sr-91 (1)	10
Sr-92	10
Y-90	1 000
Y-91	100
Y-91 m	100
Y-92	100
Y-93	100
Zr-93	10
Zr-95 (1)	1
Zr-97 (1)	10
Nb-93 m	10
Nb-94	0,1

Nb-95	1
Nb-97 (1)	10
Nb-98	10
Mo-90	10
Mo-93	10
Mo-99 (1)	10
Mo-101 (1)	10
Tc-96	1
Tc-96 m	1 000
Tc-97	10
Tc-97 m	100
Tc-99	1
Tc-99 m	100
Ru-97	10
Ru-103 (1)	1
Ru-105 (1)	10
Ru-106 (1)	0,1
Rh-103 m	10 000
Rh-105	100
Pd-103 (1)	1 000
Pd-109 (1)	100
Ag-105	1
Ag-110 m (1)	0,1
Ag-111	100
Cd-109 (1)	1
Cd-115 (1)	10
Cd-115 m (1)	100
In-111	10
In-113 m	100
In-114 m (1)	10
In-115 m	100
Sn-113 (1)	1
Sn-125	10
Sb-122	10
Sb-124	1
Sb-125 (1)	0,1
Te-123 m	1
Te-125 m	1 000
Te-127	1 000
Te-127 m (1)	10
Te-129	100
Te-129 m (1)	10
Te-131	100
Te-131 m (1)	10
Te-132 (1)	1

Te-133	10
Te-133 m	10
Te-134	10
I-123	100
I-125	100
I-126	10
I-129	0,01
I-130	10
I-131	10
I-132	10
I-133	10
I-134	10
I-135	10
Cs-129	10
Cs-131	1 000
Cs-132	10
Cs-134	0,1
Cs-134 m	1 000
Cs-135	100
Cs-136	1
Cs-137 ([1])	0,1
Cs-138	10
Ba-131	10
Ba-140	1
La-140	1
Ce-139	1
Ce-141	100
Ce-143	10
Ce-144	10
Pr-142	100
Pr-143	1 000
Nd-147	100
Nd-149	100
Pm-147	1 000
Pm-149	1 000
Sm-151	1 000
Sm-153	100
Eu-152	0,1
Eu-152 m	100
Eu-154	0,1
Eu-155	1
Gd-153	10
Gd-159	100
Tb-160	1
Dy-165	1 000

Dy-166	100
Ho-166	100
Er-169	1 000
Er-171	100
Tm-170	100
Tm-171	1 000
Yb-175	100
Lu-177	100
Hf-181	1
Ta-182	0,1
W-181	10
W-185	1 000
W-187	10
Re-186	1 000
Re-188	100
Os-185	1
Os-191	100
Os-191 m	1 000
Os-193	100
Ir-190	1
Ir-192	1
Ir-194	100
Pt-191	10
Pt-193 m	1 000
Pt-197	1 000
Pt-197 m	100
Au-198	10
Au-199	100
Hg-197	100
Hg-197 m	100
Hg-203	10
Tl-200	10
Tl-201	100
Tl-202	10
Tl-204	1
Pb-203	10
Bi-206	1
Bi-207	0,1
Po-203	10
Po-205	10
Po-207	10
At-211	1 000
Ra-225	10
Ra-227	100
Th-226	1 000

Th-229	0,1
Pa-230	10
Pa-233	10
U-230	10
U-231 (1)	100
U-232 (1)	0,1
U-233	1
U-236	10
U-237	100
U-239	100
U-240 (1)	100
Np-237 (1)	1
Np-239	100
Np-240	10
Pu-234	100
Pu-235	100
Pu-236	1
Pu-237	100
Pu-238	0,1
Pu-239	0,1
Pu-240	0,1
Pu-241	10
Pu-242	0,1
Pu-243	1 000
Pu-244 (1)	0,1
Am-241	0,1
Am-242	1 000
Am-242 m (1)	0,1
Am-243 (1)	0,1
Cm-242	10
Cm-243	1
Cm-244	1
Cm-245	0,1
Cm-246	0,1
Cm-247 (1)	0,1
Cm-248	0,1
Bk-249	100
Cf-246	1 000
Cf-248	1
Cf-249	0,1
Cf-250	1
Cf-251	0,1
Cf-252	1
Cf-253	100
Cf-254	1

Es-253	100
Es-254 (1)	0,1
Es-254 m (1)	10
Fm-254	10 000
Fm-255	100

(1) Parent radionuclides, and their progeny whose dose contributions are taken into account in the dose calculation (thus requiring only the exemption level of the parent radionuclide to be considered), are listed in the following table.

Parent radionuclide	**Progeny**
Fe-52	Mn-52 m
Zn-69 m	Zn-69
Sr-90	Y-90
Sr-91	Y-91 m
Zr-95	Nb-95
Zr-97	Nb-97 m, Nb-97
Nb-97	Nb-97 m
Mo-99	Tc-99 m
Mo-101	Tc-101
Ru-103	Rh-103 m
Ru-105	Rh-105 m
Ru-106	Rh-106
Pd-103	Rh-103 m
Pd-109	Ag-109 m
Ag-110 m	Ag-110
Cd-109	Ag-109 m
Cd-115	In-115 m
Cd-115 m	In-115 m
In-114 m	In-114
Sn-113	In-113 m
Sb-125	Te-125 m
Te-127 m	Te-127
Te-129 m	Te-129
Te-131 m	Te-131
Te132	I-132
Cs-137	Ba-137 m
Ce-144	Pr-144, Pr-144 m
U-232	Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208
U-240	Np-240 m, Np-240
Np237	Pa-233
Pu-244	U-240, Np-240 m, Np-240
Am-242 m	Np-238
Am-243	Np-239
Cm-247	Pu-243
Es-254	Bk-250

Es-254 m	Fm-254

For radionuclides not listed in Table A, Part 1 the Agency shall assign appropriate values for the quantities and concentrations of activity per unit mass where the need arises. Values thus assigned shall be complementary to those in Table A, Part 1.

TABLE A PART 2
Naturally occurring radionuclides

Values for exemption or clearance for naturally occurring radionuclides in solid materials in secular equilibrium with their progeny:

Natural radionuclides from the U-238 series	1 kBq kg^{-1}
Natural radionuclides from the Th-232 series	1 kBq kg^{-1}
K-40	10 kBq kg^{-1}

TABLE B
Total activity values for exemption (column 3) and exemption values for the activity concentration in moderate amounts of any type of material (column 2)

Radionuklid	**Specificna aktivnost (kBq kg^{-1})**	**Activnost (Bq)**
H-3	1×10^6	1×10^9
Be-7	1×10^3	1×10^7
C-14	1×10^4	1×10^7
O-15	1×10^2	1×10^9
F-18	1×10^1	1×10^6
Na-22	1×10^1	1×10^6
Na-24	1×10^1	1×10^5
Si-31	1×10^3	1×10^6
P-32	1×10^3	1×10^5
P-33	1×10^5	1×10^8
S-35	1×10^5	1×10^8
Cl-36	1×10^4	1×10^6
Cl-38	1×10^1	1×10^5
Ar-37	1×10^6	1×10^8
Ar-41	1×10^2	1×10^9
K-40 [(2)]	1×10^2	1×10^6
K-42	1×10^2	1×10^6
K-43	1×10^1	1×10^6
Ca-45	1×10^4	1×10^7
Ca-47	1×10^1	1×10^6
Sc-46	1×10^1	1×10^6
Sc-47	1×10^2	1×10^6
Sc-48	1×10^1	1×10^5
V-48	1×10^1	1×10^5

Cr-51	1×10^{3}	1×10^{7}
Mn-51	1×10^{1}	1×10^{5}
Mn-52	1×10^{1}	1×10^{5}
Mn-52 m	1×10^{1}	1×10^{5}
Mn-53	1×10^{4}	1×10^{9}
Mn-54	1×10^{1}	1×10^{6}
Mn-56	1×10^{1}	1×10^{5}
Fe-52	1×10^{1}	1×10^{6}
Fe-55	1×10^{4}	1×10^{6}
Fe-59	1×10^{1}	1×10^{6}
Co-55	1×10^{1}	1×10^{6}
Co-56	1×10^{1}	1×10^{5}
Co-57	1×10^{2}	1×10^{6}
Co-58	1×10^{1}	1×10^{6}
Co-58 m	1×10^{4}	1×10^{7}
Co-60	1×10^{1}	1×10^{5}
Co-60 m	1×10^{3}	1×10^{6}
Co-61	1×10^{2}	1×10^{6}
Co-62 m	1×10^{1}	1×10^{5}
Ni-59	1×10^{4}	1×10^{8}
Ni-63	1×10^{5}	1×10^{8}
Ni-65	1×10^{1}	1×10^{6}
Cu-64	1×10^{2}	1×10^{6}
Zn-65	1×10^{1}	1×10^{6}
Zn-69	1×10^{4}	1×10^{6}
Zn-69 m	1×10^{2}	1×10^{6}
Ga-72	1×10^{1}	1×10^{5}
Ge-71	1×10^{4}	1×10^{8}
As-73	1×10^{3}	1×10^{7}
As-74	1×10^{1}	1×10^{6}
As-76	1×10^{2}	1×10^{5}
As-77	1×10^{3}	1×10^{6}
Se-75	1×10^{2}	1×10^{6}
Br-82	1×10^{1}	1×10^{6}
Kr-74	1×10^{2}	1×10^{9}
Kr-76	1×10^{2}	1×10^{9}
Kr-77	1×10^{2}	1×10^{9}
Kr-79	1×10^{3}	1×10^{5}
Kr-81	1×10^{4}	1×10^{7}
Kr-83 m	1×10^{5}	1×10^{12}
Kr-85	1×10^{5}	1×10^{4}
Kr-85 m	1×10^{3}	1×10^{10}
Kr-87	1×10^{2}	1×10^{9}
Kr-88	1×10^{2}	1×10^{9}
Rb-86	1×10^{2}	1×10^{5}

Sr-85	1×10^{2}	1×10^{6}
Sr-85 m	1×10^{2}	1×10^{7}
Sr-87 m	1×10^{2}	1×10^{6}
Sr-89	1×10^{3}	1×10^{6}
Sr-90 [(3)]	1×10^{2}	1×10^{4}
Sr-91	1×10^{1}	1×10^{5}
Sr-92	1×10^{1}	1×10^{6}
Y-90	1×10^{3}	1×10^{5}
Y-91	1×10^{3}	1×10^{6}
Y-91 m	1×10^{2}	1×10^{6}
Y-92	1×10^{2}	1×10^{5}
Y-93	1×10^{2}	1×10^{5}
Zr-93 [(3)]	1×10^{3}	1×10^{7}
Zr-95	1×10^{1}	1×10^{6}
Zr-97 [(3)]	1×10^{1}	1×10^{5}
Nb-93 m	1×10^{4}	1×10^{7}
Nb-94	1×10^{1}	1×10^{6}
Nb-95	1×10^{1}	1×10^{6}
Nb-97	1×10^{1}	1×10^{6}
Nb-98	1×10^{1}	1×10^{5}
Mo-90	1×10^{1}	1×10^{6}
Mo-93	1×10^{3}	1×10^{8}
Mo-99	1×10^{2}	1×10^{6}
Mo-101	1×10^{1}	1×10^{6}
Tc-96	1×10^{1}	1×10^{6}
Tc-96 m	1×10^{3}	1×10^{7}
Tc-97	1×10^{3}	1×10^{8}
Tc-97 m	1×10^{3}	1×10^{7}
Tc-99	1×10^{4}	1×10^{7}
Tc-99 m	1×10^{2}	1×10^{7}
Ru-97	1×10^{2}	1×10^{7}
Ru-103	1×10^{2}	1×10^{6}
Ru-105	1×10^{1}	1×10^{6}
Ru-106 [(3)]	1×10^{2}	1×10^{5}
Rh-103 m	1×10^{4}	1×10^{8}
Rh-105	1×10^{2}	1×10^{7}
Pd-103	1×10^{3}	1×10^{8}
Pd-109	1×10^{3}	1×10^{6}
Ag-105	1×10^{2}	1×10^{6}
Ag-108 m	1×10^{1}	1×10^{6}
Ag-110 m	1×10^{1}	1×10^{6}
Ag-111	1×10^{3}	1×10^{6}
Cd-109	1×10^{4}	1×10^{6}
Cd-115	1×10^{2}	1×10^{6}
Cd-115 m	1×10^{3}	1×10^{6}

In-111	1×10^{2}	1×10^{6}
In-113 m	1×10^{2}	1×10^{6}
In-114 m	1×10^{2}	1×10^{6}
In-115 m	1×10^{2}	1×10^{6}
Sn-113	1×10^{3}	1×10^{7}
Sn-125	1×10^{2}	1×10^{5}
Sb-122	1×10^{2}	1×10^{4}
Sb-124	1×10^{1}	1×10^{6}
Sb-125	1×10^{2}	1×10^{6}
Te-123 m	1×10^{2}	1×10^{7}
Te-125 m	1×10^{3}	1×10^{7}
Te-127	1×10^{3}	1×10^{6}
Te-127 m	1×10^{3}	1×10^{7}
Te-129	1×10^{2}	1×10^{6}
Te-129 m	1×10^{3}	1×10^{6}
Te-131	1×10^{2}	1×10^{5}
Te-131 m	1×10^{1}	1×10^{6}
Te-132	1×10^{2}	1×10^{7}
Te-133	1×10^{1}	1×10^{5}
Te-133 m	1×10^{1}	1×10^{5}
Te-134	1×10^{1}	1×10^{6}
I-123	1×10^{2}	1×10^{7}
I-125	1×10^{3}	1×10^{6}
I-126	1×10^{2}	1×10^{6}
I-129	1×10^{2}	1×10^{5}
I-130	1×10^{1}	1×10^{6}
I-131	1×10^{2}	1×10^{6}
I-132	1×10^{1}	1×10^{5}
I-133	1×10^{1}	1×10^{6}
I-134	1×10^{1}	1×10^{5}
I-135	1×10^{1}	1×10^{6}
Xe-131 m	1×10^{4}	1×10^{4}
Xe-133	1×10^{3}	1×10^{4}
Xe-135	1×10^{3}	1×10^{10}
Cs-129	1×10^{2}	1×10^{5}
Cs-131	1×10^{3}	1×10^{6}
Cs-132	1×10^{1}	1×10^{5}
Cs-134 m	1×10^{3}	1×10^{5}
Cs-134	1×10^{1}	1×10^{4}
Cs-135	1×10^{4}	1×10^{7}
Cs-136	1×10^{1}	1×10^{5}
Cs-137 [(3)]	1×10^{1}	1×10^{4}
Cs-138	1×10^{1}	1×10^{4}
Ba-131	1×10^{2}	1×10^{6}
Ba-140 [(3)]	1×10^{1}	1×10^{5}

La-140	1×10^{1}	1×10^{5}
Ce-139	1×10^{2}	1×10^{6}
Ce-141	1×10^{2}	1×10^{7}
Ce-143	1×10^{2}	1×10^{6}
Ce-144 [(3)]	1×10^{2}	1×10^{5}
Pr-142	1×10^{2}	1×10^{5}
Pr-143	1×10^{4}	1×10^{6}
Nd-147	1×10^{2}	1×10^{6}
Nd-149	1×10^{2}	1×10^{6}
Pm-147	1×10^{4}	1×10^{7}
Pm-149	1×10^{3}	1×10^{6}
Sm-151	1×10^{4}	1×10^{8}
Sm-153	1×10^{2}	1×10^{6}
Eu-152	1×10^{1}	1×10^{6}
Eu-152 m	1×10^{2}	1×10^{6}
Eu-154	1×10^{1}	1×10^{6}
Eu-155	1×10^{2}	1×10^{7}
Gd-153	1×10^{2}	1×10^{7}
Gd-159	1×10^{3}	1×10^{6}
Tb-160	1×10^{1}	1×10^{6}
Dy-165	1×10^{3}	1×10^{6}
Dy-166	1×10^{3}	1×10^{6}
Ho-166	1×10^{3}	1×10^{5}
Er-169	1×10^{4}	1×10^{7}
Er-171	1×10^{2}	1×10^{6}
Tm-170	1×10^{3}	1×10^{6}
Tm-171	1×10^{4}	1×10^{8}
Yb-175	1×10^{3}	1×10^{7}
Lu-177	1×10^{3}	1×10^{7}
Hf-181	1×10^{1}	1×10^{6}
Ta-182	1×10^{1}	1×10^{4}
W-181	1×10^{3}	1×10^{7}
W-185	1×10^{4}	1×10^{7}
W-187	1×10^{2}	1×10^{6}
Re-186	1×10^{3}	1×10^{6}
Re-188	1×10^{2}	1×10^{5}
Os-185	1×10^{1}	1×10^{6}
Os-191	1×10^{2}	1×10^{7}
Os-191 m	1×10^{3}	1×10^{7}
Os-193	1×10^{2}	1×10^{6}
Ir-190	1×10^{1}	1×10^{6}
Ir-192	1×10^{1}	1×10^{4}
Ir-194	1×10^{2}	1×10^{5}
Pt-191	1×10^{2}	1×10^{6}
Pt-193 m	1×10^{3}	1×10^{7}

Pt-197	1×10^{3}	1×10^{6}
Pt-197 m	1×10^{2}	1×10^{6}
Au-198	1×10^{2}	1×10^{6}
Au-199	1×10^{2}	1×10^{6}
Hg-197	1×10^{2}	1×10^{7}
Hg-197 m	1×10^{2}	1×10^{6}
Hg-203	1×10^{2}	1×10^{5}
Tl-200	1×10^{1}	1×10^{6}
Tl-201	1×10^{2}	1×10^{6}
Tl-202	1×10^{2}	1×10^{6}
Tl-204	1×10^{4}	1×10^{4}
Pb-203	1×10^{2}	1×10^{6}
Pb-210 [(3)]	1×10^{1}	1×10^{4}
Pb-212 [(3)]	1×10^{1}	1×10^{5}
Bi-206	1×10^{1}	1×10^{5}
Bi-207	1×10^{1}	1×10^{6}
Bi-210	1×10^{3}	1×10^{6}
Bi-212 [(3)]	1×10^{1}	1×10^{5}
Po-203	1×10^{1}	1×10^{6}
Po-205	1×10^{1}	1×10^{6}
Po-207	1×10^{1}	1×10^{6}
Po-210	1×10^{1}	1×10^{4}
At-211	1×10^{3}	1×10^{7}
Rn-220 [(3)]	1×10^{4}	1×10^{7}
Rn-222 [(3)]	1×10^{1}	1×10^{8}
Ra-223 [(3)]	1×10^{2}	1×10^{5}
Ra-224 [(3)]	1×10^{1}	1×10^{5}
Ra-225	1×10^{2}	1×10^{5}
Ra-226 [(3)]	1×10^{1}	1×10^{4}
Ra-227	1×10^{2}	1×10^{6}
Ra-228 [(3)]	1×10^{1}	1×10^{5}
Ac-228	1×10^{1}	1×10^{6}
Th-226 [(3)]	1×10^{3}	1×10^{7}
Th-227	1×10^{1}	1×10^{4}
Th-228 [(3)]	1×10^{0}	1×10^{4}
Th-229 [(3)]	1×10^{0}	1×10^{3}
Th-230	1×10^{0}	1×10^{4}
Th-231	1×10^{3}	1×10^{7}
Th-234 [(3)]	1×10^{3}	1×10^{5}
Pa-230	1×10^{1}	1×10^{6}
Pa-231	1×10^{0}	1×10^{3}
Pa-233	1×10^{2}	1×10^{7}
U-230	1×10^{1}	1×10^{5}
U-231	1×10^{2}	1×10^{7}
U-232 [(3)]	1×10^{0}	1×10^{3}

U-233	1×10^{1}	1×10^{4}
U-234	1×10^{1}	1×10^{4}
U-235 [(3)]	1×10^{1}	1×10^{4}
U-236	1×10^{1}	1×10^{4}
U-237	1×10^{2}	1×10^{6}
U-238 [(3)]	1×10^{1}	1×10^{4}
U-239	1×10^{2}	1×10^{6}
U-240	1×10^{3}	1×10^{7}
U-240 [(3)]	1×10^{1}	1×10^{6}
Np-237 [(3)]	1×10^{0}	1×10^{3}
Np-239	1×10^{2}	1×10^{7}
Np-240	1×10^{1}	1×10^{6}
Pu-234	1×10^{2}	1×10^{7}
Pu-235	1×10^{2}	1×10^{7}
Pu-236	1×10^{1}	1×10^{4}
Pu-237	1×10^{3}	1×10^{7}
Pu-238	1×10^{0}	1×10^{4}
Pu-239	1×10^{0}	1×10^{4}
Pu-240	1×10^{0}	1×10^{3}
Pu-241	1×10^{2}	1×10^{5}
Pu-242	1×10^{0}	1×10^{4}
Pu-243	1×10^{3}	1×10^{7}
Pu-244	1×10^{0}	1×10^{4}
Am-241	1×10^{0}	1×10^{4}
Am-242	1×10^{3}	1×10^{6}
Am-242 m [(3)]	1×10^{0}	1×10^{4}
Am-243 [(3)]	1×10^{0}	1×10^{3}
Cm-242	1×10^{2}	1×10^{5}
Cm-243	1×10^{0}	1×10^{4}
Cm-244	1×10^{1}	1×10^{4}
Cm-245	1×10^{0}	1×10^{3}
Cm-246	1×10^{0}	1×10^{3}
Cm-247	1×10^{0}	1×10^{4}
Cm-248	1×10^{0}	1×10^{3}
Bk-249	1×10^{3}	1×10^{6}
Cf-246	1×10^{3}	1×10^{6}
Cf-248	1×10^{1}	1×10^{4}
Cf-249	1×10^{0}	1×10^{3}
Cf-250	1×10^{1}	1×10^{4}
Cf-251	1×10^{0}	1×10^{3}
Cf-252	1×10^{1}	1×10^{4}
Cf-253	1×10^{2}	1×10^{5}
Cf-254	1×10^{0}	1×10^{3}
Es-253	1×10^{2}	1×10^{5}
Es-254	1×10^{1}	1×10^{4}

Es-254 m	1×10^2	1×10^6
Fm-254	1×10^4	1×10^7
Fm-255	1×10^3	1×10^6

([2]) Potassium salts in quantities less than 1 000 kg are exempted.

([3]) Parent radionuclides, and their progeny whose dose contributions are taken into account in the dose calculation (thus requiring only the exemption level of the parent radionuclide to be considered), are listed in the following:

Parent radionuclide	**Progeny**
Sr-90	Y-90
Zr-93	Nb-93 m
Zr-97	Nb-97
Ru-106	Rh-106
Ag-108 m	Ag-108
Cs-137	Ba-137 m
Ba-140	La-140
Ce-144	Pr-144
Pb-210	Bi-210, Po-210
Pb-212	Bi-212, Tl-208 (0.36), Po-212 (0.64)
Bi-212	Tl-208 (0.36), Po-212 (0.64)
Rn-220	Po-216
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-226	Ra-222, Rn-218, Po-214
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-234	Pa-234 m
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-234 m
U-240	Np-240 m
Np237	Pa-233
Am-242 m	Am-242
Am-243	Np-239

1.8. **Annex VIII**

Definition and use of the activity concentration index for the gamma radiation emitted by building materials as referred to in Article 75 of the Directive 2013/59/EURATOM

1. For the purposes of Article 75(2), for identified types of building materials, the activity concentrations of primordial radionuclides Ra-226, Th-232 (or its decay product Ra-228) and K-40 shall be determined.

2. The activity concentration index I is given by the following formula:

$$I = C_{Ra226} /300\ Bq/kg + C_{Th232} /200\ Bq/kg + C_{K40} /3\ 000\ Bq/kg$$

where C_{Ra226}, C_{Th232} and C_{K40} are the activity concentrations in Bq/kg of the corresponding radionuclides in the building material.

3. The index relates to the gamma radiation dose, in excess of typical outdoor exposure, in a building constructed from a specified building material. The index applies to the building material, not to its constituents except when those constituents are building materials themselves and are separately assessed as such. For application of the index to such constituents, in particular residues from industries processing naturally-occurring radioactive material recycled into building materials, an appropriate partitioning factor needs to be applied. The activity concentration index value of 1 can be used as a conservative screening tool for identifying materials that may cause the reference level laid down in Article 75(1) to be exceeded. The calculation of dose needs to take into account other factors such as density, thickness of the material as well as factors relating to the type of building and the intended use of the material (bulk or superficial).

1.9. **Annex IX**

Indicative list of information for licence applications as referred to in Article 29 of the Directive 2013/59/EURATOM

1. Responsibilities and organisational arrangements for protection and safety.

2. Staff competences, including information and training.

3. Design features of the facility and of radiation sources.

4. Anticipated occupational and public exposures in normal operation.

5. Safety assessment of the activities and the facility in order to:

5.1. Identify ways in which potential exposures or accidental and unintended medical exposures could occur;

5.2. Estimate, to the extent practicable, the probabilities and magnitude of potential exposures;

5.3. Assess the quality and extent of protection and safety provisions, including engineering features, as well as administrative procedures;

5.4. Define the operational limits and conditions of operation.

6. Emergency procedures.

7. Maintenance, testing, inspection and servicing so as to ensure that the radiation source and the facility continue to meet the design requirements, operational limits and conditions of operation throughout their lifetime.

8. Management of radioactive waste and arrangements for the disposal of such waste, in accordance with applicable regulatory requirements.

8.1. Management of disused sources.

8.2. Quality assurance.

1.10. **Annex X**

Data system for individual radiological monitoring as referred to in Articles 43, 44 and 51 of the Directive 2013/59/EURATOM

GENERAL PROVISIONS

The data system for individual radiological monitoring established by Agency may be realised either as a network or as a national dose register. This data system may include the issuance of individual radiological monitoring documents for outside workers.

1. Any data system for individual radiological monitoring of exposed workers shall comprise the following sections:

1.1. Particulars concerning the worker's identity;

1.2. Particulars concerning the medical surveillance of the worker;

1.3. Particulars concerning the undertaking of the worker and, in the case of an outside worker, the employer of the worker;

1.4. The results of the individual monitoring of the exposed worker.

2. The Agency shall take the measures necessary to prevent any forgery or misuse of, or tampering with, the data system for individual radiological monitoring.

A. Data to be included in the data system for individual radiological monitoring

3. Data on the worker's identity shall include the worker's:

3.1. Surname;

3.2. First name;

3.3. Sex;

3.4. Date of birth;

3.5. Nationality; and

3.6. Unique identification number.

4. Data on the undertaking shall include the name, address and unique identification number of the undertaking.

5. Data on the employment of the worker shall include:

5.1. The name, address and unique identification number of the employer;

5.2. The starting date of individual monitoring; and where available, the end date;

5.3. The categorisation of the worker in accordance with Article 40 of the Directive.

6. The results of the individual monitoring of the exposed worker shall include the official dose record (year; effective dose in mSv; in the event of non-uniform exposure, equivalent doses in the different parts of the body in mSv; and in the event of an intake of radionuclides, the committed effective dose in mSv);

B. Data on outside workers to be supplied via the data system for individual radiological monitoring

1. Before the start of any activity, the employer of the outside worker shall supply the following data to the undertaking via the data system for individual radiological monitoring:

1.1. Data on the employment of the outside worker in accordance with Section A, point 5;

1.2. Data on the medical surveillance of the worker shall include:

1.2.1. The medical classification of the worker in accordance with Article 46 of the Directive (fit; fit, subject to certain conditions; unfit);

1.2.2. Information on any restrictions on working with radiation;

1.2.3. The date of the last periodic health review; and

1.2.4. The period of validity of the result.

1.2.5. The results of the outside worker's individual exposure monitoring in accordance with Section A, point 6, and at least for the last five calendar years including the current year.

2. The following data shall be recorded or have been recorded by the undertaking in the data system for individual radiological monitoring after the end of any activity:

2.1. The period covered by the activity;

2.2. An estimate of any effective dose received by the outside worker (for the period covered by the activity);

2.3. In the event of non-uniform exposure, an estimate of the equivalent doses in the different parts of the body;

2.4. In the event of an intake of radionuclides, an estimate of the intake or the committed effective dose.

C. **Provisions concerning the individual radiological monitoring document**

1. The Agency may decide to issue an individual radiological monitoring document for every outside worker.

2. The document shall be non-transferable.

3. The Agency shall take the measures necessary to prevent a worker from being issued with more than one valid individual monitoring document at the same time.

4. In addition to the information required in Part A and Part B, the document shall include the name and address of the issuing body and the issuing date.

1.11. **Annex XI**
Emergency management systems and emergency response plans as referred to in Articles 69, 97 and 98 of the Directive 2013/59/EURATOM

A. **Elements to be included in an emergency management system**

1. Assessment of potential emergency exposure situations and associated public and emergency occupational exposures;

2. Clear allocation of the responsibilities of persons and organisations having a role in preparedness and response arrangements;

3. Establishment of emergency response plans at appropriate levels and related to a specific facility or human activity;

4. Reliable communications and efficient and effective arrangements for cooperation and coordination at the installation and at appropriate national and international levels;

5. Health protection of emergency workers;

6. Arrangements for the provision of prior information and training for emergency workers and all other persons with duties or responsibilities in emergency response, including regular exercises;

7. Arrangements for individual monitoring or assessment of individual doses of emergency workers and the recording of doses;

8. Public information arrangements;

9. Involvement of stakeholders;

10. Transition from an emergency exposure situation to an existing exposure situation including recovery and remediation.

B. Elements to be included in an emergency response plan - For emergency preparedness:

1. Reference levels for public exposure, taking into account the criteria laid down in Annex I;

2. Reference levels for emergency occupational exposure taking into account Article 53 of the Directive.

3. Optimised protection strategies for members of the public who may be exposed, for different postulated events and related scenarios;

4. Predefined generic criteria for particular protective measures;

5. Default triggers or operational criteria such as observables and indicators of on-scene conditions;

6. Arrangements for prompt coordination between organisations having a role in emergency preparedness and response and with all other countries which may be involved or are likely to be affected;

7. Arrangements for the emergency response plan to be reviewed and revised to take account of changes or lessons learned from exercises and events.

7.1. Arrangements shall be established in advance to revise these elements, as appropriate during an emergency exposure situation, to accommodate the prevailing conditions as these evolve throughout the response.

7.2. For emergency response:

7.3. The response to an emergency exposure situation shall be undertaken through the timely implementation of preparedness arrangements, including but not limited to:

7.3.1. . Promptly implementing protective measures, if possible, before any exposure occurs;

7.3.2. Assessing the effectiveness of strategies and implemented actions and adjusting them as appropriate to the prevailing situation;

7.3.3. Comparing the doses against the applicable reference level, focusing on those groups whose doses exceed the reference level;

7.3.4. Implementing further protection strategies, as necessary, based on prevailing conditions and available information.

1.12. **Annex XII**
Information to members of the public about health protection measures to be applied and steps to be taken in the event of an emergency as referred to in Articles 70 and 71 of the Directive 2013/59/EURATOM

A. Prior information to the members of the public likely to be affected by an emergency

1. Basic facts about radioactivity and its effects on human beings and on the environment;

2. The various types of emergency covered and their consequences for the public and the environment;

3. Emergency measures envisaged to alert, protect and assist the public in the event of an emergency;

4. Appropriate information on action to be taken by the public in the event of an emergency.

B. Information to be provided to the affected members of the public in the event of an emergency

1. On the basis of the emergency response plan previously drawn up, the members of the public actually affected in the event of an emergency shall rapidly and regularly receive:

1.1. Information on the type of emergency which has occurred and, where possible, its characteristics (e.g. its origin, extent and probable development);

1.2. Advice on protection, which, depending on the type of emergency, may:

1.2.1. Cover the following: restrictions on the consumption of certain foodstuffs and water likely to be contaminated, simple rules on hygiene and decontamination, recommendations to stay indoors, distribution and use of protective substances, evacuation arrangements;

1.2.2. Be accompanied, where necessary, by special warnings for certain groups of the members of the public;

1.3. Announcements recommending cooperation with instructions or requests by the Agency.

2. If the emergency is preceded by a pre-alarm phase, the members of the public likely to be affected shall already receive information and advice during that phase, such as:

2.1. An invitation to the members of the public concerned to tune in to relevant communication channels;

2.2. Preparatory advice to establishments with particular collective responsibilities;

2.3. Recommendations to occupational groups particularly affected.

3. This information and advice shall be supplemented, if time permits, by a reminder of the basic facts about radioactivity and its effects on human beings and on the environment.

1.13. **Annex XIII**

Indicative list of types of building materials considered with regard to their emitted gamma radiation as referred to in Article 75 of the Directive 2013/59/EURATOM

1. Natural materials

1.1. Alum-shale.

1.2. Building materials or additives of natural igneous origin, such as:

1.2.1. Granitoides (such as granites, syenite and orthogneiss),

1.2.2. Porphyries;

1.2.3. Tuff;

1.2.4. Pozzolana (pozzolanic ash);

1.2.5. Lava.

2. Materials incorporating residues from industries processing naturally-occurring radioactive material, such as:

2.1. Fly ash;

2.2. Phosphogypsum;

2.3. Phosphorus slag;

2.4. Tin slag;

2.5. Copper slag;

2.6. Red mud (residue from aluminium production);

2.7. Residues from steel production

1.14. **Annex XIV**
Information to be provided in the records for high-activity sealed sources (HASS) as referred to in Article 89 of the Directive 2013/59/EURATOM

<table>
<tr><td colspan="3">STANDARD RECORD SHEET FOR HIGH-ACTIVITY SEALED SORCES (HASS) (optional in italic)</td></tr>
<tr><td>1. HASS identification number</td><td rowspan="2">2. Identification of the licensed undertaking

Name:
Address:
Country:

Manufacturer □
Supplier □
User □</td><td rowspan="2">3. Location of HASS (use or storage) if not the same as in 2.

Name:
Address:
Country:

Fixed use □
Storage □
Mobile use □</td></tr>
<tr><td>Manufacturer device number

Field of use:</td></tr>
<tr><td>4. Recording

Date of start of recording:
Date of transfer of records to historic file:</td><td>5. License

Number:
Date of issue:
Date of expire:</td><td>6. Operational control of HASS
Date:
Date:
Date:</td></tr>
<tr><td>7. HASS characteristics
Year of manufacture:
Radionuclide:
Activity at the date of manufacturing:
Activity reference date:
Manufacturer/Supplier (*)
Name:
Address:
Country:
Physical and chemical characteristics
Source type identification:
Capsule identification:
ISO classification:
ANSI classification:
LAEA source category:

Neutron source: Yes □ No □
Neutron source target:
Neutron flux:</td><td>8. Receipt of HASS

Date of receipt:
Receipt from:
Name:
Address:
Country:
Manufacturer □
Supplier □
Another user □
9. Transfer HASS
Date of transfer:
Transfer to:
Name:
Address:
Country
License number:
Date of issue:
Date of expiry:
Manufacturer □
Supplier □
Other undertaking □
Facility for long term storage or disposal □</td><td>Date:
Date:
Date:
Date:
Date:
Date:
Date:
Date:
Date:
10. Further information
Loss □ date of loss:
Theft □ date of theft:
Findings: Yes □ Ne □
Date:
Place:
Other information:</td></tr>
</table>

(*) Where the manufacturer of the source is established outside of the community, the name and the address of the importer-supplier may be provided instead

1.15. **Annex XV**
Requirements for undertakings responsible for a high-activity sealed source as referred to in Article 91 of the Directive 2013/59/EURATOM

1. Each undertaking responsible for a high-activity sealed source shall:

1.1. Ensure that suitable tests, such as leak tests based on international standards, are undertaken regularly in order to check and maintain the integrity of each source;

1.2. Regularly verify at specific determined intervals, that each source and, where relevant, the equipment containing the source are still present and in apparently good condition at their place of use or storage;

1.3. Ensure that each fixed and mobile source is subject to adequate documented measures, such as written protocols and procedures, aimed at preventing unauthorised access to or loss or theft of the source or its damage by fire;

1.4. Promptly notify the Agency of any loss, theft, leakage or unauthorised use of a source, arrange for a check on the integrity of each source after any event, including fire, that may have damaged the source, and, if appropriate, inform the Agency thereof and of the measures taken;

1.5. Return each disused source to the supplier or place it in a facility for long term storage or disposal or transfer it to another authorised undertaking unless otherwise agreed Agency, without undue delay after termination of the use;

1.6. Ascertain that, before a transfer is made, the recipient has appropriate licence.

1.7. Promptly notify the Agency of any accident or incident resulting in unintentional exposure of a worker or a member of the public.

1.16. **Annex XVI**
Identification and marking of high-activity sealed sources as referred to in Article 91 of the Directive 2013/59/EURATOM

1. The manufacturer or supplier ensures that:

1.1. Each high-activity sealed source is identified by a unique number. This number shall be engraved or stamped on the source, where practicable. The number shall also be engraved or stamped on the source container. If this is not feasible, or in the case of reusable transport containers, the source container shall, at least, bear information on the nature of the source.

1.2. The source container and, where practicable, the source are marked and labelled with an appropriate sign to warn people of the radiation hazard.

2. The manufacturer provides a photograph of each manufactured source design type and a photograph of the typical source container.

3. The undertaking ensures that each high-activity sealed source is accompanied by written information indicating that the source is identified and marked in compliance with point 1 and that the markings and labels referred to in point 1 remain legible. The information shall include photographs of the source, source container, transport packaging, device and equipment as appropriate.

1.17. **Annex XVII**
Indicative list of types of existing exposure situations as referred to in Article 100 of the Directive 2013/59/EURATOM

1. Exposure due to contamination of areas by residual radioactive material from:

    1.1. Past activities that were never subject to regulatory control or were not regulated in accordance with the legal requirements.

    1.2. An emergency, after the emergency exposure situation has been declared ended, as provided for in the emergency management system;

    1.3. Residues from past activities for which the undertaking is no longer legally accountable;

2. Exposure to natural radiation sources, including:

    2.1. Indoor exposure to radon and thoron, in workplaces, dwellings and other buildings;

    2.2. Indoor external exposure from building materials;

3. Exposure to commodities excluding food, animal feeding stuffs and drinking water incorporating

    3.1. Radionuclides from contaminated areas specified in point 1, or

    3.2. Naturally-occurring radionuclides.

1.18. **Annex XVIII**
List of items to be considered in preparing the national action plan to address long-term risks from radon exposures as referred to in Articles 54, 74 and 103 of the Directive 2013/59/EURATOM

1.Strategy for conducting surveys of indoor radon concentrations or soil gas concentrations for the purpose of estimating the distribution of indoor radon concentrations, for the management of measurement data and for the establishment of other relevant parameters (such as soil and rock types, permeability and radium-226 content of rock or soil).

2. Approach, data and criteria used for the delineation of areas or for the definition of other parameters that can be used as specific indicators of situations with potentially high exposure to radon.

3. Identification of types of workplaces and buildings with public access, such as schools, underground workplaces, and those in certain areas, where measurements are required, on the basis of a risk assessment, considering for instance occupancy hours.

4. The basis for the establishment of reference levels for dwellings and workplaces. If applicable, the basis for the establishment of different reference levels for different uses of buildings (dwellings, buildings with public access, workplaces) as well as for existing and for new buildings.

5. Assignment of responsibilities (governmental and non-governmental), coordination mechanisms and available resources for implementation of the action plan.

6. Strategy for reducing radon exposure in dwellings and for giving priority to addressing the situations identified under point 2.

7. Strategies for facilitating post construction remedial action.

8. Strategy, including methods and tools, for preventing radon ingress in new buildings, including identification of building materials with significant radon exhalation.

9. Schedules for reviews of the action plan.

10. Strategy for communication to increase public awareness and inform local decision makers, employers and employees of the risks of radon, including in relation to smoking.

11. Guidance on methods and tools for measurements and remedial measures. Criteria for the accreditation of measurement and remediation services shall also be considered.

12. Where appropriate, provision of financial support for radon surveys and for remedial measures, in particular for private dwellings with very high radon concentrations.

13. Long-term goals in terms of reducing lung cancer risk attributable to radon exposure (for smokers and non- smokers).

14. Where appropriate, consideration of other related issues and corresponding programmes such as programmes on energy saving and indoor air quality.

1.19. **Annex XIX**
Radiation practices that are subject to registration only

No.	Practice name	Description
1	X-ray fluorescence	Use of x-ray emitting radioactive source in radiation devices for analysis purposes.
2	Electron capture detection	Use of sealed sources in gas chromatography; if the device contains less than 10 x EQ (e.g., for Ni-63 this means less than 1 GBq) it is exempt from licensing. H-3 is also used.
3	Bone mineral analysis	Use of a radiation device to analyze bone in humans.
4	Beta backscatter gauges	Use of a beta-emitting radioactive source incorporated in radiation devices to measure thickness of materials and coatings.
5	Electronic component testing	Use of Kr-85 to test the integrity of electronic components.
6	Research – maximum sealed radioactive source activity of 50 MBq	Use of sealed sources for research purposes. The maximum activity for each sealed source is less than 50 MBq.
7	Industry - maximum sealed radioactive source activity of 100 MBq	Industrial applications of radiation devices and sealed sources not otherwise covered by another use-type. Uses may include, but are not limited to, fuel gauges in aircraft, aircraft components and spark gap igniters.
8	Dew point detection	Use of sealed radioactive sources in dew pointers.
9	Static elimination	Possession and use of radiation devices containing sealed sources for static elimination.
10	Static detection	Possession and use of radiation devices for static detection.
11	Radioluminescence	Use of tritium-activated, self-luminous radiation devices.
12	Surge voltage protection	Use of radiation devices to limit power surges in electronic components.
13	Radioactive luminous compounds	Possession of instruments containing radioactive luminous radioactive sources for display or use.
14	Remote blade inspection	Use of radiation devices to monitor helicopter blade integrity.
15	Teaching – maximum sealed radioactive source activity of up to 50 MBq	Use of sealed sources for teaching purposes.
16	Radioactive check sources	Possession of small sealed sources for the purpose of checking the function of radioactive detection instruments where the check source is not exempt under NSRD section 8.1.
17	Liquid scintillation counters	Many now exempt under the NSRD, liquid scintillation counters are often found in laboratories and associated with 815 and other operations or standalone in laboratory situations to measure low-activity beta emitters.
18	Workplaces	Workplaces exceeding radon limits, and for existing exposure situations which are of concern from a radiation protection point of view
19	Practice involving naturally−occurring radioactive material	Exposure of workers or members of the public which cannot be disregarded from a radiation protection point of view, account industrial sectors