

The Swedish Radiation Protection Authority's Regulations on the Import and Export as well as Reporting of Radioactive Substances;

issued on April 20th 2006.

On the basis of § 7 of the Radiation Protection Ordinance (1988:293), the Swedish Radiation Protection Authority has issued the following regulations.¹

Applicability

1 § These regulations apply to import into and export out of Sweden of radioactive substances of category I, II or III and reporting of such substances.¹ The regulations also apply to disused sealed sources but not to other radioactive waste.

The regulations do not apply to nuclear material. Concerning such substances regulations are issued by the law (1984:3) on nuclear activities.

Concerning transfer within the European union the sections 3 – 8 do not apply. Instead the Council regulation (Euratom) 93/1493 of 8 June 1993 on shipments of radioactive substances between Member States² apply.

Definitions

2 § In these regulations terms and concepts are used with the meanings specified here.

Competent authority: an authority that according to the national laws has the right to grant licences regarding radioactive substances for the appropriate practice,

sealed source: a source, whose structure is such as to prevent dispersion of radioactive substances under normal conditions of use, and whose capsule, where applicable, is enclosing the radioactive substance as an integral part of the source,

source of category I: a sealed source with an activity which amounts to or exceeds the values that are shown in the *Annex*, table 1, or equipment or container the total activity of which amounts to or exceeds the values that are shown in the *Annex*, table 1,

source of category II: a sealed source whose activity amounts to or exceeds the values that are shown in the *Annex*, table 2, but does not amount to the values in the *Annex*, table 1, or equipment or container the total activity of which amounts to or exceeds the values that are shown in the *Annex*, table 2, but does not amounts to the values in the *Annex*, table 1,

¹ Cf. IAEA Code of conduct on the safety and security of radioactive sources, IAEA, Vienna, 2004.

² O.J. L 148 19.6.1993, s.1 (Celex 393R1493)

source of category III: a sealed source whose activity amounts to or exceeds the values that are shown in the *Annex*, table 3, but does not amount to the values in the *Annex*, table 2, or an unsealed source the activity of which exceeds the values in the *Annex*, table 3,

unsealed source: a radioactive substance that does not meet the requirements on a sealed source.

Export

3 § An application for a licence to export a source of category I or II from Sweden shall contain

1. the name of the applicant, address and personal code number or the company's registration number,
2. the name of the consignee, business-address (or corresponding) and, if applicable, the address where the source is to be placed,
3. radionuclide and its activity,
4. the intended use of the source and
5. the planned point of time for the shipment.

If the export regards a source of category II, the application shall also contain a copy of a document showing that the consignee has a licence for import and possession or a certificate from the competent authority in the recipient country that the consignee has such a licence.

4 § When a licence for export of a source of category I or II is granted the licence-holder shall notify the competent authority in the recipient country not later than seven days in advance of the shipment. A copy of the notification shall be sent to the Swedish Radiation Protection Authority at the same time.

The announcement shall contain information on

1. the name and address of the consignor,
2. the name and address of the consignee,
3. radionuclide and its activity,
4. the number of sources and their summed up activity if there are more than one source,
5. the type designation and if applicable the identification number and
6. the estimated point of time for the shipment.

5 § If the export concerns a radioactive substance of category III the consignor shall make sure that the consignee in the recipient country has a licence for import and possession of the radioactive substance prior to the shipment.

Import

6 § An application for a licence to import a source of category I or II to Sweden shall contain

1. the name of the applicant, address and personal code number or the company's registration number,
2. the name and address of the consignor,
3. radionuclide and its activity,
4. the type designation and if applicable the identification number,
5. the intended use and
6. the estimated point of time for the import.

An application for a licence to import sources may comprise several sources of the same type to be imported during a certain period.

7 § If an imported source of category I or II is intended to be transferred within Sweden, the application shall also include information on to whom it is intended to be supplied.

Transit

8 § An application for a licence to import and export a source into and out of Sweden shall be carried out by the one who is responsible for the transport within Sweden. The application shall include

1. the type designation of the source, its radionuclide and activity,
2. the estimated points of time for import and export respectively,
3. the mode of transport within Sweden and
4. the intended final destination.

If the transit has concerned sources of category I or II, the Swedish Radiation Protection Authority shall be notified as soon as the source is out of Sweden.

Transfer within Sweden

9 § Anyone who intends to transfer radioactive substances must only supply the substances to those who have a licence for possession of the radioactive substance, when such a licence is required. Prior to the transfer the consignor shall make sure that the consignee has a licence.

10 § Anyone who has a licence according to section 20 of the Radiation Protection Act (1988:220) and transfers radioactive substances shall keep a record of customers and transfers during the period of validity of the licence and after that for at least three years.

A record is however not necessary if the sources are of a kind for which a licence is not required.

Reporting

11 § Anyone who transfers radioactive substances within Sweden, regardless of category according to these regulations, shall yearly before the end of the month of March to the Swedish Radiation Protection Authority send a report regarding the previous calendar year that contains

1. the total amount of transferred activity of unsealed sources for each radionuclide and the largest individual activity for each radionuclide,
2. the number of transferred sealed sources, regardless of category, their summed up activity and the largest individual activity for each radionuclide and
3. a list of the customers to which sources have been transferred including the licence numbers of the customers.

The reports are to be sent electronically in a format that is decided by the Swedish Radiation Protection Authority if not otherwise is allowed.

12 § An individual user, who without a middleman has imported radioactive substances into Sweden, shall before the end of the month of March to the Swedish Radiation Protection Authority send a report regarding the previous calendar year that contains

1. the total imported activity of unsealed sources for each radionuclide and
2. the number of sealed sources and their summed up activity for each radionuclide.

Exemption

13 § If special grounds exist the Swedish Radiation Protection Authority may grant exemption from these regulations.

These regulations enter into force on October 1st 2006 when the Swedish Radiation Protection Authority's regulations (SSI FS 1996:1) on Additional Regulations to the EC-Regulation (Euratom 1493/93) on Shipments of Radioactive Substances between Member States shall cease to apply.

On behalf of the board the Swedish Radiation Protection Authority

LARS-ERIK HOLM

Gunilla Hellström

Table 1 The lowest levels of activity of sealed sources that define sources of category I³

Nuclide	Activity (Bq)	Nuclide	Activity (Bq)
Fe-55	$8 \cdot 10^{17}$	Yb-169	$3 \cdot 10^{14}$
Co-57	$7 \cdot 10^{14}$	Tm-170	$2 \cdot 10^{16}$
Co-60	$3 \cdot 10^{13}$	Ir-192	$8 \cdot 10^{13}$
Ni-63	$6 \cdot 10^{16}$	Au-198	$2 \cdot 10^{14}$
Ge-68	$7 \cdot 10^{14}$	Tl-204	$2 \cdot 10^{16}$
Se-75	$2 \cdot 10^{14}$	Po-210	$6 \cdot 10^{14}$
Sr-90 (Y-90)	$1 \cdot 10^{15}$	Ra-226	$4 \cdot 10^{13}$
Pd-103	$9 \cdot 10^{16}$	Pu-238	$6 \cdot 10^{13}$
Ru-106 (Rh-106)	$3 \cdot 10^{14}$	Pu-239/Be	$6 \cdot 10^{13}$
Cd-109	$2 \cdot 10^{16}$	Am-241	$6 \cdot 10^{13}$
Cs-137	$1 \cdot 10^{14}$	Am-241/Be	$6 \cdot 10^{13}$
Pm-147	$4 \cdot 10^{16}$	Cm-244	$5 \cdot 10^{13}$
Gd-153	$1 \cdot 10^{15}$	Cf-252	$2 \cdot 10^{13}$

A source that contains more than one radionuclide shall be regarded a category I source if

$$\sum_k A_k/L_k \geq 1$$

where A_k is the activity of nuclide k and L_k is the activity level for the nuclide k according to table 1.

³ Category I is defined as 1000 times the D-value according to IAEA's definition of dangerous sources (IAEA Safety Standards Categorization of Radioactive Sources, Safety Guide No. RS-G-1.9, Vienna 2005) where the possibility of acute radiation damages are taken into account. The table contains those radionuclides that appear in the corresponding table in IAEA's Code of conduct on the safety and security of radioactive sources, Vienna 2004

Table 2 The lowest levels of activity of sealed sources that define sources of category II⁴

For nuclides not included in the table one hundredth of the A_1 -values as given in IAEA's Safety Standards apply, (Safety Standards Series No. TS-R-1 (ST-1, Revised: Regulations for the Safe Transport of Radioactive Material, 1996 Edition (Revised) Vienna 2000.

Nuclide	Activity (Bq)	Nuclide	Activity (Bq)
H-3	$4 \cdot 10^{11}$	Pm-147	$4 \cdot 10^{11}$
Fe-55	$4 \cdot 10^{11}$	Gd-153	$1 \cdot 10^{11}$
Co-57	$1 \cdot 10^{11}$	Yb-169	$4 \cdot 10^{10}$
Co-60	$4 \cdot 10^9$	Tm-170	$3 \cdot 10^{10}$
Ni-63	$4 \cdot 10^{11}$	Ir-192	$1 \cdot 10^{10}$
Se-75	$3 \cdot 10^{10}$	Au-198	$1 \cdot 10^{10}$
Kr-85	$1 \cdot 10^{11}$	Tl-204	$1 \cdot 10^{11}$
Sr-90 ^a	$3 \cdot 10^9$	Po-210	$4 \cdot 10^{11}$
Pd-103 ^a	$4 \cdot 10^{11}$	Ra-226 ^{a,b}	$2 \cdot 10^9$
Ru-106 ^a	$2 \cdot 10^9$	Pu-238	$1 \cdot 10^{11}$
Cd-109	$3 \cdot 10^{11}$	Am-241 ^b	$1 \cdot 10^{11}$
I-125	$2 \cdot 10^{11}$	Cm-244	$2 \cdot 10^{11}$
Cs-137 ^a	$2 \cdot 10^{10}$	Cf-252	$5 \cdot 10^8$

^a The levels of activity include the contributions from daughter-nuclides having half-life shorter than ten days.

^b Neutron-sources with beryllium are included.

A source that contains more than one radionuclide shall be regarded a category II source if

$$\sum_k A_k/L_k \geq 1$$

where A_k is the activity of nuclide k and L_k is the activity level for the nuclide k according to table 2.

⁴ The A_1 -values correspond for most radionuclides the activity that give rise to a dose-rate of 100 millisievert per hour at a distance of one metre. One hundredth of the A_1 -values given here are identical with the levels as given by EC-directive 2003/122/Euratom on the control of high-activity sealed radioactive sources and orphan sources, at which levels the directive apply.

Table 3 The lowest levels of activity or specific activity respectively that define sources of category III⁵

Nuclides indicated by + or sec represent mother-nuclides in balance with its daughter-nuclides. In those cases the values refer to the mother-nuclide but daughter-nuclides are taken into account..

Nuclide	Activity (Bq)	Specific activity (kBq/kg)	Nuclide	Activity (Bq)	Specific activity (kBq/kg)
H-3	10 ⁹	10 ⁶	Mn-56	10 ⁵	10
Be-7	10 ⁷	10 ³	Fe-52	10 ⁶	10
C-14	10 ⁷	10 ⁴	Fe-55	10 ⁶	10 ⁴
O-15	10 ⁹	10 ²	Fe-59	10 ⁶	10
F-18	10 ⁶	10	Co-55	10 ⁶	10
Na-22	10 ⁶	10	Co-56	10 ⁵	10
Na-24	10 ⁵	10	Co-57	10 ⁶	10 ²
Si-31	10 ⁶	10 ³	Co-58	10 ⁶	10
P-32	10 ⁵	10 ³	Co-58m	10 ⁷	10 ⁴
P-33	10 ⁸	10 ⁵	Co-60	10 ⁵	10
S-35	10 ⁸	10 ⁵	Co-60m	10 ⁶	10 ³
Cl-36	10 ⁶	10 ⁴	Co-61	10 ⁶	10 ²
Cl-38	10 ⁵	10	Co-62m	10 ⁵	10
Ar-37	10 ⁸	10 ⁶	Ni-59	10 ⁸	10 ⁴
Ar-41	10 ⁹	10 ²	Ni-63	10 ⁸	10 ⁵
K-40	10 ⁶	10 ²	Ni-65	10 ⁶	10
K-42	10 ⁶	10 ²	Cu-64	10 ⁶	10 ²
K-43	10 ⁶	10	Zn-65	10 ⁶	10
Ca-45	10 ⁷	10 ⁴	Zn-69	10 ⁶	10 ⁴
Ca-47	10 ⁶	10	Zn-69m	10 ⁶	10 ²
Sc-46	10 ⁶	10	Ga-72	10 ⁵	10
Sc-47	10 ⁶	10 ²	Ge-71	10 ⁸	10 ⁴
Sc-48	10 ⁵	10	As-73	10 ⁷	10 ³
V-48	10 ⁵	10	As-74	10 ⁶	10
Cr-51	10 ⁷	10 ³	As-76	10 ⁵	10 ²
Mn-51	10 ⁵	10	As-77	10 ⁶	10 ³
Mn-52	10 ⁵	10	Se-75	10 ⁶	10 ²
Mn-52m	10 ⁵	10	Br-82	10 ⁶	10
Mn-53	10 ⁹	10 ⁴	Kr-74	10 ⁹	10 ²
Mn-54	10 ⁶	10	Kr-76	10 ⁹	10 ²

to be continued

⁵ The levels are identical to the lowest levels that are not excluded from the requirement of a licence according to the EC-directive 96/29/Euratom. The same levels also appear in the Swedish Radiation Protection Ordinance (1988:293).

Table 3 continuation

Nuclide	Activity (Bq)	Specific activity (kBq/kg)	Nuclide	Activity (Bq)	Specific activity (kBq/kg)
Kr-77	10 ⁹	10 ²	Tc-97	10 ⁸	10 ³
Kr-79	10 ⁵	10 ³	Tc-97m	10 ⁷	10 ³
Kr-81	10 ⁷	10 ⁴	Tc-99	10 ⁷	10 ⁴
Kr-83m	10 ¹²	10 ⁵	Tc-99m	10 ⁷	10 ²
Kr-85	10 ⁴	10 ⁵	Ru-97	10 ⁷	10 ²
Kr-85m	10 ¹⁰	10 ³	Ru-103	10 ⁶	10 ²
Kr-87	10 ⁹	10 ²	Ru-105	10 ⁶	10
Kr-88	10 ⁹	10 ²	Ru-106+	10 ⁵	10 ²
Rb-86	10 ⁵	10 ²	Rh-103m	10 ⁸	10 ⁴
Sr-85	10 ⁶	10 ²	Rh-105	10 ⁷	10 ²
Sr-85m	10 ⁷	10 ²	Pd-103	10 ⁸	10 ³
Sr-87m	10 ⁶	10 ²	Pd-109	10 ⁶	10 ³
Sr-89	10 ⁶	10 ³	Ag-105	10 ⁶	10 ²
Sr-90+	10 ⁴	10 ²	Ag-108m+	10 ⁶	10
Sr-91	10 ⁵	10	Ag-110m	10 ⁶	10
Sr-92	10 ⁶	10	Ag-111	10 ⁶	10 ³
Y-90	10 ⁵	10 ³	Cd-109	10 ⁶	10 ⁴
Y-91	10 ⁶	10 ³	Cd-115	10 ⁶	10 ²
Y-91m	10 ⁶	10 ²	Cd-115m	10 ⁶	10 ³
Y-92	10 ⁵	10 ²	In-111	10 ⁶	10 ²
Y-93	10 ⁵	10 ²	In-113m	10 ⁶	10 ²
Zr-93+	10 ⁷	10 ³	In-114m	10 ⁶	10 ²
Zr-95	10 ⁶	10	In-115m	10 ⁶	10 ²
Zr-97+	10 ⁵	10	Sn-113	10 ⁷	10 ³
Nb-93m	10 ⁷	10 ⁴	Sn-125	10 ⁵	10 ²
Nb-94	10 ⁶	10	Sb-122	10 ⁴	10 ²
Nb-95	10 ⁶	10	Sb-124	10 ⁶	10
Nb-97	10 ⁶	10	Sb-125	10 ⁶	10 ²
Nb-98	10 ⁵	10	Te-123m	10 ⁷	10 ²
Mo-90	10 ⁶	10	Te-125m	10 ⁷	10 ³
Mo-93	10 ⁸	10 ³	Te-127	10 ⁶	10 ³
Mo-99	10 ⁶	10 ²	Te-127m	10 ⁷	10 ³
Mo-101	10 ⁶	10	Te-129	10 ⁶	10 ²
Tc-96	10 ⁶	10	Te-129m	10 ⁶	10 ³
Tc-96m	10 ⁷	10 ³	Te-131	10 ⁵	10 ²

to be continued

Table 3 continuation

Nuclide	Activity (Bq)	Specific activity (kBq/kg)	Nuclide	Activity (Bq)	Specific activity (kBq/kg)
Te-131m	10 ⁶	10	Pr-143	10 ⁶	10 ⁴
Te-132	10 ⁷	10 ²	Nd-147	10 ⁶	10 ²
Te-133	10 ⁵	10	Nd-149	10 ⁶	10 ²
Te-133m	10 ⁵	10	Pm-147	10 ⁷	10 ⁴
Te-134	10 ⁶	10	Pm-149	10 ⁶	10 ³
I-123	10 ⁷	10 ²	Sm-151	10 ⁸	10 ⁴
I-125	10 ⁶	10 ³	Sm-153	10 ⁶	10 ²
I-126	10 ⁶	10 ²	Eu-152	10 ⁶	10
I-129	10 ⁵	10 ²	Eu-152m	10 ⁶	10 ²
I-130	10 ⁶	10	Eu-154	10 ⁶	10
I-131	10 ⁶	10 ²	Eu-155	10 ⁷	10 ²
I-132	10 ⁵	10	Gd-153	10 ⁷	10 ²
I-133	10 ⁶	10	Gd-159	10 ⁶	10 ³
I-134	10 ⁵	10	Tb-160	10 ⁶	10
I-135	10 ⁶	10	Dy-165	10 ⁶	10 ³
Xe-131m	10 ⁴	10 ⁴	Dy-166	10 ⁶	10 ³
Xe-133	10 ⁴	10 ³	Ho-166	10 ⁵	10 ³
Xe-135	10 ¹⁰	10 ³	Er-169	10 ⁷	10 ⁴
Cs-129	10 ⁵	10 ²	Er-171	10 ⁶	10 ²
Cs-131	10 ⁶	10 ³	Tm-170	10 ⁶	10 ³
Cs-132	10 ⁵	10	Tm-171	10 ⁸	10 ⁴
Cs-134m	10 ⁵	10 ³	Yb-175	10 ⁷	10 ³
Cs-134	10 ⁴	10	Lu-177	10 ⁷	10 ³
Cs-135	10 ⁷	10 ⁴	Hf-181	10 ⁶	10
Cs-136	10 ⁵	10	Ta-182	10 ⁴	10
Cs-137+	10 ⁴	10	W-181	10 ⁷	10 ³
Cs-138	10 ⁴	10	W-185	10 ⁷	10 ⁴
Ba-131	10 ⁶	10 ²	W-187	10 ⁶	10 ²
Ba-140+	10 ⁵	10	Re-186	10 ⁶	10 ³
La-140	10 ⁵	10	Re-188	10 ⁵	10 ²
Ce-139	10 ⁶	10 ²	Os-185	10 ⁶	10
Ce-141	10 ⁷	10 ²	Os-191	10 ⁷	10 ²
Ce-143	10 ⁶	10 ²	Os-191m	10 ⁷	10 ³
Ce-144+	10 ⁵	10 ²	Os-193	10 ⁶	10 ²
Pr-142	10 ⁵	10 ²	Ir-190	10 ⁶	10

to be continued

Table 3 continuation

Nuclide	Activity (Bq)	Specific activity (kBq/kg)	Nuclide	Activity (Bq)	Specific activity (kBq/kg)
Ir-192	10 ⁴	10	Ac-228	10 ⁶	10
Ir-194	10 ⁵	10 ²	Th-226+	10 ⁷	10 ³
Pt-191	10 ⁶	10 ²	Th-227	10 ⁴	10
Pt-193m	10 ⁷	10 ³	Th-228+	10 ⁴	1
Pt-197	10 ⁶	10 ³	Th-229+	10 ³	1
Pt-197m	10 ⁶	10 ²	Th-230	10 ⁴	1
Au-198	10 ⁶	10 ²	Th-231	10 ⁷	10 ³
Au-199	10 ⁶	10 ²	Th-232sec	10 ³	1
Hg-197	10 ⁷	10 ²	Th-234+	10 ⁵	10 ³
Hg-197m	10 ⁶	10 ²	Pa-230	10 ⁶	10
Hg-203	10 ⁵	10 ²	Pa-231	10 ³	1
Tl-200	10 ⁶	10	Pa-233	10 ⁷	10 ²
Tl-201	10 ⁶	10 ²	U-230+	10 ⁵	10
Tl-202	10 ⁶	10 ²	U-231	10 ⁷	10 ²
Tl-204	10 ⁴	10 ⁴	U-232+	10 ³	1
Pb-203	10 ⁶	10 ²	U-233	10 ⁴	10
Pb-210+	10 ⁴	10	U-234	10 ⁴	10
Pb-212+	10 ⁵	10	U-235+	10 ⁴	10
Bi-206	10 ⁵	10	U-236	10 ⁴	10
Bi-207	10 ⁶	10	U-237	10 ⁶	10 ²
Bi-210	10 ⁶	10 ³	U-238+	10 ⁴	10
Bi-212+	10 ⁵	10	U-238sec	10 ³	1
Po-203	10 ⁶	10	U-239	10 ⁶	10 ²
Po-205	10 ⁶	10	U-240	10 ⁷	10 ³
Po-207	10 ⁶	10	U-240+	10 ⁶	10
Po-210	10 ⁴	10	Np-237+	10 ³	1
At-211	10 ⁷	10 ³	Np-239	10 ⁷	10 ²
Rn-220+	10 ⁷	10 ⁴	Np-240	10 ⁶	10
Rn-222+	10 ⁸	10	Pu-234	10 ⁷	10 ²
Ra-223+	10 ⁵	10 ²	Pu-235	10 ⁷	10 ²
Ra-224+	10 ⁵	10	Pu-236	10 ⁴	10
Ra-225	10 ⁵	10 ²	Pu-237	10 ⁷	10 ³
Ra-226+	10 ⁴	10	Pu-238	10 ⁴	1
Ra-227	10 ⁶	10 ²	Pu-239	10 ⁴	1
Ra-228+	10 ⁵	10	Pu-240	10 ³	1

to be continued

Table 3 continuation

Nuclide	Activity (Bq)	Specific activity (kBq/kg)	Nuclide	Activity (Bq)	Specific activity (kBq/kg)
Pu-241	10 ⁵	10 ²	Bk-249	10 ⁶	10 ³
Pu-242	10 ⁴	1	Cf-246	10 ⁶	10 ³
Pu-243	10 ⁷	10 ³	Cf-248	10 ⁴	10
Pu-244	10 ⁴	1	Cf-249	10 ³	1
Am-241	10 ⁴	1	Cf-250	10 ⁴	10
Am-242	10 ⁶	10 ³	Cf-251	10 ³	1
Am-242m+	10 ⁴	1	Cf-252	10 ⁴	10
Am-243+	10 ³	1	Cf-253	10 ⁵	10 ²
Cm-242	10 ⁵	10 ²	Cf-254	10 ³	1
Cm-243	10 ⁴	1	Es-253	10 ⁵	10 ²
Cm-244	10 ⁴	10	Es-254	10 ⁴	10
Cm-245	10 ³	1	Es-254m	10 ⁶	10 ²
Cm-246	10 ³	1	Fm-254	10 ⁷	10 ⁴
Cm-247	10 ⁴	1	Fm-255	10 ⁶	10 ³
Cm-248	10 ³	1			

A source or an amount of radioactive substances that contains more than one radionuclide shall be regarded a category III source if

$$\sum_k A_k/L_k \geq 1$$

where A_k is the activity or the specific activity of nuclide k and L_k is the activity or the specific activity level for the nuclide k according to table 3.