

Radiation and Nuclear Safety Authority Regulation on the Security Arrangements of Radiation Sources that Require a Safety Licence

Adopted in Vantaa on 4 October 2023

In accordance with a decision of the Radiation and Nuclear Safety Authority, the following provisions are issued by virtue of Sections 29(3) and 67(3) of the Radiation Act (859/2018):

Section 1 Scope of application

This regulation lays down provisions on the security arrangements of radiation sources that require a safety licence.

However, with regard to radiation appliances that produce radiation electrically, the regulation only applies to mobile X-ray equipment.

The Act on the Transport of Dangerous Goods (541/2023) applies to the security arrangements of transports.

The regulation does not apply to an area that has in place security arrangements approved in accordance with section 71 of the Nuclear Energy Act (990/1987) for nuclear material or nuclear waste.

Section 2 Levels of security arrangements

The places where radiation is used and radiation sources are stored have a security arrangements level A, B or C, depending on the radiation sources.

If the place of use or storage has radiation sources that belong to multiple security arrangements levels, the security arrangements must be implemented according to the radiation source that requires the highest level of security arrangements.

Section 3 Security arrangements level A

The security arrangements must be implemented according to level A if:

- 1) the activity of the sealed or unsealed source is greater than thousand times or equal to the activity specified in the table in the Appendix; or
- 2) the sealed and unsealed sources at a place of use or storage meet the following condition:

$$\sum_n \frac{A_n}{R_n} \geq 1000,$$

where

A_n is the activity of radionuclide n in a single sealed or unsealed source.

In the case of unsealed sources, A_n is the maximum activity used in the operation of the unsealed source that contains radionuclide n .

R_n is the activity of radionuclide n , as specified in the Table 1 in the Appendix 1.

Section 4 Security arrangements level B

The security arrangements must be implemented according to level B if:

- 1) the activity of the sealed or unsealed source is greater than or equal to the activity specified in the table in the Appendix; or
- 2) the sealed and unsealed sources at a place of use or storage meet the following condition:

$$\sum_n \frac{A_n}{R_n} \geq 1,$$

where

A_n is the activity of radionuclide n in a single sealed or unsealed source.

In the case of unsealed sources, A_n is the maximum activity used in the operation of the unsealed source that contains radionuclide n .

R_n is the activity of radionuclide n , as specified in the table in the appendix;

- 3) the radiation appliance is industrial, plug-in, mobile radiography equipment that generates radiation electrically.

Section 5 Security arrangements level C

The security arrangements must be implemented according to level C if:

- 1) the activity of the sealed or unsealed source is greater than the exemption value specified in the regulation of the Radiation and Nuclear Safety Authority;
- 2) the X-ray equipment is mobile.

Section 6 Measures at security arrangements level C

At security arrangements level C, radiation sources must be protected using:

- 1) at least one structural barrier in the immediate vicinity of the the place of use and storage of the radiation source; or
- 2) a structural barrier within the radiation appliance and outside the place of use use and storage .

The structural barrier may be replaced by having personnel on site.

Access to the place of use and storage of radiation sources must be limited to individuals who have a justified reason to access the place in order to manage the radiation sources or the place of use and storage or which, in the field of health care, must be able to move in the vicinity of the radiation source at the places of use and storage.

Section 7 Measures at security arrangements level B

The arrangements specified in section 6 apply to security arrangements level B, and these must be complemented as described in this section.

The undertaking must have security arrangements plan in place, in accordance with Section 11.

The security arrangements plan, procedures and other such information must be handled and stored so as to prevent access by other than authorised individuals who need the information in order to carry out their duties.

The undertaking shall verify at least once per month that all the radiation sources in its care requiring level B security arrangements are appropriately in their places. The implementation of such verifications shall be documented.

Section 8 Structural barriers at security arrangements level B

At security arrangements level B, radiation sources must be protected using at least two structural barriers. At least one of the structural barriers must be in the radiation appliance or in its immediate vicinity.

The structural barriers may be replaced by having personnel on site. If the structural barriers are replaced by having personnel on site, the personnel must be able to report any illegal activities or suspicions thereof immediately.

Section 9 Access control and alarm system at security arrangements level B

At security arrangements level B, the place of use and storage must have an access control system.

Access to the place of use and storage of radiation sources must be limited to individuals who have received sufficient instructions and guidance on the security arrangements, in view of the nature and type of work, and who have a justified reason to access the place in order to manage the radiation sources or the place of use and storage.

Any place of use and storage that may contain a radiation source without supervision must be covered by a remotely controlled alarm system. The alarm must be automatically directed to a place where the alarm confirmation process can start immediately.

Section 10 Measures at security arrangements level A

The arrangements specified in Sections 7–9 apply to security arrangements level A, and these must be complemented as described in this section.

The security arrangements plan must be reviewed regularly, at least once every three years.

By way of derogation from Section 8, all the structural barriers cannot be replaced by having personnel on site.

The place of use and storage of the radiation sources must be equipped with remote surveillance camera or an equivalent arrangement so that any event causing an alarm can be immediately confirmed.

Section 11 Security arrangements plan

At security arrangements levels A and B, the security arrangements plan must contain at least the following:

- 1) the undertaking's name, the number of the safety licence that covers the use of radiation and the preparation and publication date of the plan;
- 2) division of responsibilities between the different parties of the security arrangements, list of responsible persons and their duties;
- 3) the purpose of uses of the radiation sources, a list of radiation sources covered the security arrangements, the radionuclide and activity of sealed sources and the maximum operative activity of unsealed sources;

- 4) a description of the location, the level of security arrangements, structural barriers, access control and alarm systems of the place of use and storage of radiation sources and an picture that specifies at least the following:
 - a) the location of radiation sources;
 - b) structural barriers;
 - c) access control systems;
 - d) alarm systems;
- 5) instructions or references to instructions on:
 - a) the regular checks of radiation sources;
 - b) operations and communication in radiation safety deviations;
 - c) the security arrangements plan and how to keep the security arrangements up-to-date;
 - d) the handling and storage of security arrangements documents.

Section 12

Entry into force and transitional provisions

This regulation enters into force on 1 November 2023 and is valid until further notice.

This regulation applies to any matters pending on the date of its entry into force.

This regulation repeals the Radiation and Nuclear Safety Authority Regulation on the Security Arrangements of Radiation Sources that Require a Safety Licence (STUK S/9/2021).

In Helsinki on 4 October 2023

Director General Petteri Tiippana

Director Tommi Toivonen

Availability of the regulation, guidance and advice

This regulation has been published as part of the regulations issued by the Radiation and Nuclear Safety Authority (STUK) and it is available from the Radiation and Nuclear Safety Authority.

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Collection of regulations: <http://www.finlex.fi/fi/viranomaiset/normi/555001/>

APPENDIX 1

Table 1. Activity R_n of radionuclide n

Radionuclide	Activity R_n of radionuclide n (Becquerel)
H-3	$2 \cdot 10^{15}$
C-11	$6 \cdot 10^{10}$
N-13	$6 \cdot 10^{10}$
C-14	$5 \cdot 10^{13}$
F-18	$6 \cdot 10^{10}$
Na-22	$3 \cdot 10^{10}$
P-32	$1 \cdot 10^{13}$
P-33	$2 \cdot 10^{14}$
S-35	$6 \cdot 10^{13}$
Ca-45	$1 \cdot 10^{14}$
Cr-51	$2 \cdot 10^{12}$
Fe-55	$8 \cdot 10^{14}$
Co-57	$7 \cdot 10^{11}$
Co-60	$3 \cdot 10^{10}$
Cu-64	$3 \cdot 10^{11}$
Ga-67	$5 \cdot 10^{11}$
Ga-68	$7 \cdot 10^{10}$
Ge-68	$7 \cdot 10^{10}$
Se-75	$2 \cdot 10^{11}$
Br-82	$3 \cdot 10^{10}$
Kr-85	$3 \cdot 10^{13}$
Rb-86	$7 \cdot 10^{11}$
Y-90	$5 \cdot 10^{12}$
Sr-90	$1 \cdot 10^{12}$
Tc-99m	$7 \cdot 10^{11}$
Mo-99	$3 \cdot 10^{11}$
Pd-103	$9 \cdot 10^{13}$
In-111	$2 \cdot 10^{11}$

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Radionuclide	Activity R_n of radionuclide n (Becquerel)
I-123	$5 \cdot 10^{11}$
I-124	$6 \cdot 10^{10}$
I-125	$2 \cdot 10^{11}$
I-131	$2 \cdot 10^{11}$
Cs-134	$4 \cdot 10^{10}$
Cs-137	$1 \cdot 10^{11}$
Pm-147	$4 \cdot 10^{13}$
Sm-153	$2 \cdot 10^{12}$
Gd-153	$1 \cdot 10^{12}$
Tm-170	$2 \cdot 10^{13}$
Lu-177	$2 \cdot 10^{12}$
Ir-192	$8 \cdot 10^{10}$
Tl-201	$1 \cdot 10^{12}$
Tl-204	$2 \cdot 10^{13}$
Ra-223	$1 \cdot 10^{11}$
Ra-226	$4 \cdot 10^{10}$
Pu-238	$6 \cdot 10^{10}$
Am-241	$6 \cdot 10^{10}$
Cf-252	$2 \cdot 10^{10}$

In the case of other radionuclides, the Radiation and Nuclear Safety Authority specifies the values of the activity R_n of radionuclide n based on international recommendations.