

Radiation and Nuclear Safety Authority Regulation on the Investigation, Assessment and Monitoring of Occupational Exposure

Adopted in Helsinki on 13 December 2018

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

Section 1

Prior investigation and assessment of the worker's radiation exposure

In the investigation referred to in section 89, subsection 22, of the Radiation Act, previous radiation doses shall be ascertained from the workers' dose register to ensure that the radiation doses do not exceed the dose limit. If all the worker's previous radiation doses cannot be obtained from the dose register, the previous doses shall be ascertained from the worker or his or her prior employer.

The assessment referred to in Section 89, subsection 1 of the Radiation Act shall estimate the effective dose to the worker and the equivalent doses to the organs.

Section 2

Arranging radiological surveillance

Radiological surveillance shall include measurements or determinations to ensure that the workers' exposure conditions have not changed.

For practices with an occupational exposure category 3 and for health care X-ray and radiotherapy accelerator practices, the exposure conditions shall be determined by means of dose rate measurements upon commencement of the practices and whenever any changes are made to them. Thereafter, the monitoring of constancy of exposure conditions is a sufficient means for radiological surveillance.

In practices other than those referred to in subsection 2, the radiological surveillance shall include regular measurement of the dose rate of external radiation as well as determination of the activity concentration of contaminating radionuclides in the air and determination of the surface contamination caused by radionuclides, if possible in view of the nature of the practices.

Section 3

Determination of surface contamination

For surface contamination caused by radionuclides, sufficient measurements shall be carried out to detect contamination and prevent its spread.

Surface activity shall be determined from the amount of loose and attached radioactive substances. Surface activity shall be determined as the average activity over an area of 100 cm², if possible.

Council Directive 2013/59/Euratom (32013L0059); OJEU L 13, 17.1.2014, p. 1
Reported to the Commission in accordance with Article 33 of the Treaty establishing the European Atomic Energy Community.

Section 4

Actions in response to surface contamination

Actions shall be taken to remove or contain surface contamination if the surface activity at the place of use of radiation exceeds the limits specified in Table 1 of Annex 1.

The provisions of subsection 1 above shall not apply to the inner surfaces of fume cupboards and other similar processing facilities or contamination protectors that are used when working in contaminated areas.

If the workplace, tools or clothing cannot be sufficiently decontaminated, their use shall be restricted and the passage of radioactive substances into the body and their spread into the environment shall be prevented by other means.

Section 5

Individual monitoring for external radiation exposure

If a worker is exposed to external radiation exposure, the personal dose equivalent to the worker shall be measured in individual monitoring.

A separate measurement shall be carried out for determining the equivalent dose to the lens of the eye if the dose to the lens of the eye cannot be assessed with a sufficient degree of accuracy based on other measurements carried out for the purpose of individual monitoring.

The doses to the hands or the skin of fingers shall be assessed or measured whenever new working methods or radioactive substances are introduced if there is no sufficient prior knowledge of the exposure they cause in order to assess the necessity of arranging individual monitoring. The doses to the hands or fingers shall also be determined when the worker starts working with unsealed sources.

Section 6

Individual monitoring for internal exposure

If radionuclides have, or are suspected of having, ended up on the worker's skin or body, the activity present in the worker's body shall be determined by means of measuring equipment suitable for the purpose. The committed effective dose to the worker shall be assessed based on the measurement result. The results of the measurement and the assessment shall be reported to the workers' dose register.

The doses arising from internal radiation exposure shall be assessed or measured if new working methods or radioactive substances or materials containing them are introduced if there is no sufficient prior knowledge of the internal exposure they cause.

Section 7

Equivalent dose to the thyroid gland

When iodine isotopes in an easily volatile form are handled, the amount of radioactive substances accumulated in the worker's thyroid gland shall be monitored.

If the amount of activity detected in the worker's thyroid gland exceeds 5 kBq, the resulting equivalent dose to the thyroid gland shall be determined and the result shall be reported in the workers' dose register.

Section 8

Determining the individual dose

In health care X-ray practices where the reading of the personal dosimeter when measured on the surface of the protective apron used by the worker may exceed 20 mSv per year, the undertaking shall assess the effective dose to the worker.

If the worker may become subject to skin contamination or exposure of the lens of the eye, hands, arms, feet or ankles, the equivalent dose to the exposed part of the body shall be determined.

If the worker may become subject to internal exposure, the committed effective dose arising from internal radiation or the equivalent dose of the organs where the radioactive substance accumulates shall be determined.

Section 9

Determining the individual dose computationally

If individual dosimetry cannot be carried out or no suitable method of measurement is available, the doses to the worker shall be estimated computationally based on the measurement results of workers who were under individual monitoring, the results of the radiological surveillance, or by means of a reliable calculation method. The undertaking shall be responsible for carrying out the dose estimate. The estimated dose and the method of estimating shall be reported to the workers' dose register.

Section 10

Comparing the results of radiological surveillance and individual monitoring against the dose limits

The values of ambient and directional dose equivalent and personal dose equivalent obtained as measurement results in radiological surveillance and individual monitoring shall be compared against the values of the worker's dose limits.

The computationally determined effective dose arising from radon, radioactive air contamination and other internal exposure shall be compared against the dose limit values.

Section 11

Monitoring of internal exposure for the purpose of individual monitoring

For internal radiation exposure, the undertaking shall define intervals for the regular monitoring of radiation exposure.

Section 12

Use of a radiation alarm or alarming radiation meter

A radiation alarm or alarming radiation meter shall be used in addition to a personal dosimeter in any work where the worker may be suddenly exposed to a large radiation dose.

The alarm of the radiation alarm and alarming radiation meter shall be so clear that it is noticed with certainty irrespective of the environmental conditions and the use of personal protective equipment.

Section 13

Delivering data to the workers' dose register

The results of individual monitoring shall be reported to the workers' dose register no later than one month from the end of the measurement period.

The data shall be delivered to the workers' dose register over the technical access connection defined by the Radiation and Nuclear Safety Authority. For a duly justified reason, individual pieces of information can also be delivered by other means.

A radiation dose caused in connection with a radiation safety deviation shall be reported separately from the other dose caused by radiation work. Additionally, the method of determining the dose shall be indicated.

Section 14

Reporting of doses

The dose caused by external radiation shall be reported to the workers' dose register using the quantities deep dose $H_p(10)$, surface dose $H_p(0.07)$ and equivalent dose to the lens of the eye $H_p(3)$.

The deep dose caused by neutron radiation shall be reported separately from the deep dose caused by photon radiation.

The dose measured with a finger dosimeter and other dose to the hands shall be reported as a surface dose.

The dose determined by means of a computational method shall be reported as an effective dose unless the use of some other quantity is necessary for a justified reason.

The dose caused by internal radiation shall be reported as committed effective dose or as an equivalent dose to the thyroid gland.

Section 15

Entry into force

This regulation enters into force on 15 December 2018 and is valid until further notice.

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

In Helsinki on 13 December 2018

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/en/viranomaiset/normi/555001/>

ANNEX 1

Table 1. Surface activity limits in the use of unsealed sources.

Radioactive substance	Workplaces and tools		Workers	
	Controlled area (Bq/cm ²)	Supervised area (Bq/cm ²)	Clothes (Bq/cm ²)	Skin (Bq/cm ²)
Alpha emitters	4	0.4	0.4	0.2
Beta and gamma emitters	40	4	4	2