IMPLEMENTING DECREE

No. 422

of 14th December 2016

on Radiation Protection and Security of a Radioactive Source

The State Office for Nuclear Safety provides, pursuant to § 236 of Act No 263/2016, the Atomic Act, the implementation of § 9(2)(c) and (j), § 17(3), § 24(7), § 25(2)(a) through (d), § 60(4), § 61(6), § 63(6), § 66(6), § 67(4), § 68(2)(a) through (i), § 69(2), § 70(2)(b) and (c), § 71(2), § 72(5), § 73(3), § 74(4), § 75(5)(a), § 76(6), § 77(2), § 78(3), § 81(3), § 83(7), § 84(6), § 85(4), § 86(3), § 87(5), § 88(6), § 89(2), § 93(4), § 95(6), § 96(3), § 98(4), § 99(5), § 100(3), § 101(4), § 104(9) and § 164(2):

PART ONE

INTRODUCTORY PROVISIONS

§ 1

Subject matter

This implementing decree implements the respective Euratom[1)] regulations and provides requirements for the provision of radiation protection in exposure situations and a method for the security of radioactive sources, including radioactive sources of security levels 1 to 3.

Definitions

§ 2

For the purposes of this implementing decree, the following definitions apply

a) absorbed dose refers to the quotient of the mean energy imparted by ionising radiation to the matter in a volume element and the weight of the matter in this volume element;
b) activity refers to the quotient of the expected number of nuclear transitions from the energy state and the time interval within which such transitions appear;
c) D-value refers to the activity in the radioactive source that may cause serious tissue reaction if not supervised; the D-value is specified in Annex 1 to this implementing decree;
d) equivalent dose refers to the product of the radiation weighing factor and the mean absorbed dose in an organ or tissue for ionising radiation, or the sum of such products, if the ionising radiation field is composed of more types and energies; the radiation weighing factor is specified in Annex 2 to this implementing decree;
e) effective dose refers to the sum of the products of tissue weighing factors and the equivalent dose in exposed tissues or organs; the tissue weighing factor is specified in Annex 2 to this implementing decree;
f) collective effective dose refers to the sum of the effective doses of everyone in a certain group;

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1) Council Directive 2013/51/Euratom of 22 October 2013 laying down requirements for the protection of the health of the general public with regard to radioactive substances in water intended for human consumption.
Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom.

g) time τ
   1. refers to 50 years for radionuclide intake in adults, or
   2. a period until the age of 70 for radionuclide intake in children;
h) committed effective dose refers to the integral over time of the effective dose rate over time τ as of radionuclide intake;
i) committed equivalent dose refers to the integral over time of the equivalent dose rate over time τ as of radionuclide intake;
j) dose equivalent refers to the product of the absorbed dose at a point of tissue and the quality factor that expresses the different biological efficiency of different kinds of ionising radiation; the quality factor is specified in Annex 2 to this implementing decree;
k) individual dose equivalent refers to the dose equivalent at a point under the body surface in the depth of tissue,
l) ICRU sphere: A sphere of 30 cm diameter made of tissue equivalent material with a density of 1 g/cm3 and a mass composition of 76.2% oxygen, 11.1% carbon, 10.1% hydrogen and 2.6% nitrogen,
m) ambient dose equivalent H*(10): The dose equivalent at a point in a radiation field that would be produced by the corresponding aligned and expanded field in the ICRU sphere at a depth of 10 mm on the radius opposing the direction of the aligned field,
n) directional dose equivalent H´(0,07): The dose equivalent at a point in a radiation field that would be produced by the corresponding expanded field in the ICRU sphere at a depth 0,07 mm on a radius in a specified direction,
o) equivalent activity volume concentration of radon refers to the weighted sum of the activity volume concentration a_1 ^{218}Po, the activity volume concentration a_2 ^{214}Pb and the activity volume concentration a_3 ^{214}Bi; the equivalent activity volume concentration of radon is equal to the sum of $0.106 \times a_1$, $0.513 \times a_2$ and $0.381 \times a_3$;
p) radionuclide intake refers to the radionuclide activity received by a human body from the environment, usually by ingestion or inhalation;
q) conversion factor of radionuclide intake refers to the coefficient specifying the effective dose corresponding to a unit radionuclide intake; the conventional values of the conversion factors of radionuclide intake are specified in Annex 3 to this implementing decree;
r) h_{ing} conversion factor of radionuclide intake by ingestion;
s) h_{inh} conversion factor of radionuclide intake by inhalation;
t) I_{ing} annual radionuclide intake by ingestion;
u) I_{inh} annual radionuclide intake by inhalation;
v) indicative dose refers to the committed effective dose from the annual intake of all radionuclides present in water, with the exception of tritium, ^{40}K, ^{222}Rn and its short-lived progeny;
w) dental computed tomography refers to a dental panoramic device or a different device used for dental treatment in dental radiodiagnostics for making images of the teeth, jaws or skull allowing tomographic or panoramic images to be taken using a wide cone-beam, or images to be acquired by computed tomography, or creating three-dimensional images or tomography scans.
x) stray radiation ionising radiation that is irradiated from the source of ionising radiation bud it is outside of the main beam.

PART TWO

RADIATION PROTECTION

Title I
General rules of radiation protection

Part 1
Limits

§ 3

General limits for the public
(To § 63(6) of the Atomic Act)

The general limits for public exposure from all allowed or registered activities per calendar year are
a) 1 mSv for the sum of effective doses from external exposure and committed effective doses from internal exposure;
b) 15 mSv for the equivalent dose for the eye lens; and
c) 50 mSv for the average equivalent dose per cm^2 of the skin regardless of the size of exposed surface.

§ 4

Limits for exposed workers
(To § 63(6) of the Atomic Act)

(1) The limits for exposed workers shall be applied to the restrictions of occupational exposures and are

a) 20 mSv for the sum of effective doses from external exposure and committed effective doses from internal exposure per calendar year or the value approved by the State Office for Nuclear Safety (hereinafter referred to as the "Office") pursuant to § 63(4) of the Atomic Act, however, less than or equal to 100 mSv over any 5 consecutive calendar years and simultaneously 50 mSv per calendar year;
b) 100 mSv for the equivalent dose in the eye lens over any 5 consecutive years and simultaneously 50 mSv per calendar year;
c) 500 mSv for the average equivalent dose per cm^2 of the skin per calendar year regardless of the size of exposed surface; and
d) 500 mSv per calendar year for the equivalent dose in the upper extremities from the fingers to the forearm and in the lower extremities from the feet to the ankles.

(2) The assessment of whether the limits for exposed workers have been exceeded or not shall

a) be performed systematically;
b) take into account the sum of doses from all exposure pathways and during all work activities that an exposed worker performs; and
c) take into account, in the case of an exposed worker who is not an outside worker, the performance of all work activities during which the exposed worker is exposed, while the

exposure is subject to the limits for an exposed worker, for more declarants, registrants or licensees.

(3) An exposed worker in whom the exceeding of the exposure limits is detected shall not be temporarily allowed to work with a source of ionising radiation until their medical fitness for further work with the source of ionising radiation is assessed and conditions for such work specified.

(4) Exceeding the limits for an exposed worker who is found medically fit pursuant to subsection 3 shall not be the reason for his/her exclusion from usual work activity or his/her relocation to a different workplace unless the person for whom the work activity is performed has some other serious reasons.

§ 5

Limits for pupils and students
(To § 63(6) of the Atomic Act)

(1) The following limits for pupils and students shall be assessed by the licensee in whose workplace the pupils and students are to work with a source of ionising radiation during their studies.

(2) The assessment of whether the limits for pupils and students have been exceeded or not shall

a) be performed systematically, while
b) taking into account the sum of all exposure pathways and all activities performed by the pupils and students with the source of ionising radiation.

(3) The limits per calendar year for pupils and students between the ages of 16 and 18 who have to work with a source of ionising radiation during their studies are

a) 6 mSv for the sum of effective doses from external exposure and committed effective doses from internal exposure;
b) 15 mSv for the equivalent dose for the eye lens;
c) 150 mSv for the average equivalent dose per cm^2 of the skin regardless of exposed surface; and
d) 150 mSv for the equivalent dose in the upper extremities from the fingers to the forearm and in the lower extremities from the feet to the ankles.

(4) The limits for pupils and students below the age of 16 who have to work with a source of ionising radiation during their studies are the same as those for the public.

(5) The limits for pupils and students over the age of 18 who have to work with a source of ionising radiation during their studies are the same as those for an exposed worker.

§ 6

Derived limits
(To § 63(6) of the Atomic Act)

(1) Limits for exposed workers are regarded as not exceeded if quantitative indicators expressed in measurable quantities (hereinafter referred to as “derived limits”) have not been exceeded.

(2) The derived limits for external exposure are

a) 500 mSv per calendar year for the annual individual dose equivalent at a depth of 0.07 mm;
b) 20 mSv per calendar year for the annual individual dose equivalent at a depth of 3 mm; and
c) 20 mSv per calendar year for the annual individual dose equivalent at a depth of 10 mm.

(3) The derived limits for internal exposure per calendar year, except for the cases laid down in subsection 5, are for individual radionuclide intake by an exposed worker

a) by ingestion activity

$$\frac{0{,}02}{h_{ing}},$$

b) by inhalation activity

$$\frac{0{,}02}{h_{inh}}.$$

(4) For simultaneous external and internal exposure over a calendar year, except for the cases specified in subsection 6, the limits for exposed workers are regarded as not exceeded if the following conditions apply simultaneously

Hp (0,07) $\leq$ 0,5 Sv and

$$H_p(10) + \sum_i h_{i,ing}\, I_{i,ing} + \sum_i h_{i,inh}\, I_{i,inh} \leq 0{,}02\ Sv,$$

where

$H_p(0.07)$ (Sv) refers to the annual individual dose equivalent at a depth of 0.07 mm;

$H_p(10)$ (Sv) refers to the annual individual dose equivalent at a depth of 10 mm;

$h_{i,ing}$ (Sv/Bq) refers to the conversion factor for individual radionuclide intake by ingestion; the conversion factor is specified in Annex 3 to this implementing decree,

$I_{i,ing}$ (Bq) refers to an individual’s annual intake of radionuclides by digestion;

$h_{i,inh}$ (Sv/Bq) refers to the conversion factor for individual radionuclide intake by inhalation; the conversion factor is specified in Annex 3 to this implementing decree, and

$I_{i,inh}$ (Bq) refers to an individual’s annual intake of radionuclides by inhalation.

(5) The annual intake of radionuclides, their form or characteristics of inhaled aerosols for which Annex 3 to this implementing decree specifies the highest conversion factor for intake by ingestion or inhalation shall be used for the calculation pursuant to subsection 4 for non-identified radionuclides, chemical forms or characteristics of inhaled aerosol.

(6) For exposure to a mixture of long-lived radionuclides that emit alpha particles of the uranium-radium series, the derived limit refers to the intake of 3 200 Bq by inhalation per calendar year.

Part 2

Optimisation of radiation protection

Procedures for the optimisation of radiation protection

§ 7

(To § 66(6)(c) of the Atomic Act)

(1) When optimising radiation protection, any person who performs activities involving exposure situations shall specify the variants of radiation protection and choose the optimal variant to ensure radiation protection in the respective exposure situation.

(2) The selection of the optimal variant of radiation protection shall be performed by comparing options to reduce the planned and potential doses to which natural persons or groups of members of the public will be exposed. The measures taken to protect individuals or groups of members of the public against the influence of a source of ionising radiation can be applied

a) at the source of ionising radiation;
b) in the environment between the source of ionising radiation and the individual; or
c) on the individual level.

(3) When selecting the optimal variant of radiation protection to be ensured, a reduction of the magnitude of exposure directly at the source of ionising radiation shall be preferred.

(4) When selecting the optimal variant for ensuring radiation protection, representative features related to the respective activity shall be taken into account. The representative features are specified in Annex 4 to this implementing decree.

(5) When selecting the optimal variant for ensuring radiation protection, it is advisable to carry out a comparison of the costs related to various measures for improving radiation protection, if possible, particularly the evacuation of individuals or the building of sufficient barriers, along with a financial analysis of the expected exposure reduction.

(6) The comparison of costs according to subsection 5 shall be carried out by multiplying the reduction of the collective effective dose for the group of individuals being assessed by a factor of

a) 0.5 MCZK/Sv for radiation activity for which the average effective dose for an individual is lower than 1/10 of the respective exposure limits;
b) 1 MCZK/Sv for radiation activity for which the average effective dose for an individual is greater than 1/10 but less than 3/10 of the respective exposure limits;
c) 2.5 MCZK/Sv for radiation activity for which the average effective dose for an individual is greater than 3/10 of the respective exposure limits;
d) 1 MCZK/Sv for medical exposure;
e) 0.5 MCZK/Sv for exposure from a natural source of ionising radiation that is not caused by radiation activity; or
f) 2.5 MCZK/Sv for emergency exposures.

§ 8

(To § 66(6)(c) of the Atomic Act)

(1) Any person who performs activities within the framework of exposure situations shall regularly employ the procedures for the optimisation of radiation protection not to neglect any

newly occurring conditions for the respective exposure situation or any new possibilities for ensuring radiation protection for the respective exposure situation, namely in the case where exposure limits, specified dose constraints or reference levels have been exceeded.

(2) For medical exposure of patients for radiotherapeutic purposes, including the therapeutical applications of radionuclides, exposures of target volumes shall be individually planned for every person undergoing the treatment and their delivery appropriately verified taking into account that doses to non-target volumes and tissues shall be as low as reasonably achievable and consistent with the intended radiotherapeutic purpose of the exposure.

(3) When specifying dose constraints for radiation activity or a source of ionising radiation, the following shall be taken into account

a) previous experience concerning similar activities and sources of ionising radiation so that the radiation protection level is not lower than before; and
b) influences of other activities and sources of ionising radiation to avoid exceeding exposure limits.

(4) When optimising radiation protection, the entire procedure for such optimisation shall be documented.

(5) Documentation of the optimisation of radiation protection shall

a) describe the procedure for such optimisation systematically and in a structured way;
b) take into account all significant aspects concerning the exposure situation used for such optimisation; and
c) include the employed variants of radiation protection to be ensured along with representative features.

§ 9

Evaluation of the exposure of a representative person and an optimisation study
(To § 81(3)(d) and § 82(4) of the Atomic Act)

(1) The evaluation of the exposure of a representative person shall be performed by conservative estimates. The procedures for the execution of the conservative estimates of the exposure of a representative person are specified in Annex 5 to this implementing decree.

(2) The content of the optimisation study to establish the authorised exposure limit for a representative person is specified in Annex 6 to this implementing decree.

Part 3
Categorisation

§ 10

Exemption
(To § 67(4) of the Atomic Act)

(1) The exemption levels for the activity of radionuclides are specified in Annex 7 to this implementing decree. The exemption levels for activity are related to a total amount of radioactive substances used by a person within the framework of a certain radiation activity.

(2) The exemption levels for the activity weight concentration of the radionuclides used within the framework of a certain radiation activity are specified in Annex 7 to this implementing decree.

(3) The activity of a mixture of radionuclides is lower than the exemption levels if the sum of the quotients of the activities of individual radionuclides and the respective exemption levels of activities is less than 1.

(4) The activity weight concentration of a mixture of radionuclides is lower than the exemption levels if the sum of the quotients of the activity weight concentrations of individual radionuclides and the respective exemption levels of the activity weight concentration is less than 1.

§ 11

High-activity source
(To § 60(4)(b) of the Atomic Act)

The activity level that makes a sealed radioactive source a high-activity source is specified in Annex 8 to this implementing decree.

Categorisation of sources of ionising radiation

§ 12

(To § 61(6)(a) of the Atomic Act)

A non-significant source of ionising radiation refers to

a) a radiation generator emitting ionising radiation whose energy does not exceed 5 keV, which is not a significant source of ionising radiation;
b) a cathode-ray tube designed for imaging or different electrical equipment operating at a potential difference not exceeding 30 kV for which the ambient dose equivalent rate at any accessible point at a distance of 0.1 m from its surface is less than 1 μSv/h; or
c) a radioactive substance for which the sum of the quotients
   1. of the activities for particular radionuclides and the respective exemption levels of activity is not greater than 1; or
   2. of the activity weight concentrations for particular radionuclides and the respective exemption levels of activity weight concentration is not greater than 1.

§ 13

(To § 61(6)(a) of the Atomic Act)

A minor source of ionising radiation refers to

a) a radiation generator that is not a non-significant source or a significant source of ionising radiation provided that it is constructed in a manner allowing the ambient dose equivalent rate at any accessible point at a distance of 0.1 m from the equipment surface to be less than 1 μSv/h and at points that are exclusively intended for handling and operating by hand under normal operating conditions, where the directional dose equivalent rate can be up to 250 μSv/h;
b) a sealed radioactive source that is not a non-significant source of ionising radiation and for which the sum of the quotients of the activities for individual radionuclides and the respective exemption levels of activity or the sum of the quotients of the activity weight concentrations for individual radionuclides and the respective exemption levels of activity weight concentrations is less than 100 in the case of long-lived radioactive sources emitting alpha particles, including radioactive sources emitting neutrons, and less than 1 000 in the remaining cases;

c) any equipment containing a sealed radioactive source that is not a non-significant source of ionising radiation provided that it is constructed in a manner allowing the ambient dose equivalent rate at any accessible point at a distance of 0.1 m from the equipment surface to be less than 1 µSv/h and at points that are exclusively intended for handling and operating by hand under normal operating conditions, where the directional dose equivalent rate can be up to 250 µSv/h; or
d) an unsealed radioactive source that is not a non-significant source of ionising radiation for which the sum of the quotients of the activities and the respective exemption levels of activities or the sum of the quotients of the activity weight concentrations and the respective exemption levels of activity weight concentrations for individual radionuclides is less than 10.

§ 14

(To § 61(6)(a) of the Atomic Act)

A simple source of ionising radiation refers to a source of ionising radiation that is not classified as a non-significant, minor, significant and very significant source of ionising radiation.

§ 15

(To § 61(6)(a) of the Atomic Act)

A significant source of ionising radiation refers to
a) a radiation generator intended for medical exposure, with the exception of a bone densitometer and a dental X-ray device other than for dental computed tomography;
b) a particle accelerator;
c) a source of ionising radiation designed for proton, neutron and other heavy-particle radiotherapy;
d) equipment containing a sealed radioactive source designed for radiotherapy;
e) equipment containing a sealed radioactive source designed for irradiation of objects, including food and raw materials, objects of common use or other objects;
f) a mobile flaw detector with a sealed radioactive source; or
g) a high-activity source.

§ 16

(To § 61(6)(a) of the Atomic Act)

A nuclear reactor is classified as a very significant source of ionising radiation.

Categorisation for the purposes of cross-border motion and security

§ 17

(To § 61(6)(b) of the Atomic Act)

(1) A source of ionising radiation of security level 1 refers to

a) a radioactive thermoelectric generator;
b) a radioactive irradiator, including an irradiator for tissues and blood;
c) a sealed radioactive source for which the ratio of its current activity and D-value is equal to or greater than 1 000; or

d) an unsealed radioactive source for which the ratio of the highest processed activity in the workplace and D-value is equal to or greater than 1 000.

(2) A source of ionising radiation of security level 2 refers to

a) a sealed radioactive source designed for flaw detection;
b) a sealed radioactive source designed for brachytherapy with a high or medium dose rate;
c) a sealed radioactive source not provided in paragraphs a or b for which the ratio of its current activity and D-value is less than 1 000 and simultaneously equal to or s greater than 10; or
d) an unsealed radioactive source for which the ratio of the highest processed activity in the workplace and D-value is less than 1 000 and simultaneously equal to or greater than 10.

(3) A source of ionising radiation of security level 3 refers to

a) a sealed radioactive source designed for logging;
b) a sealed radioactive source in an indicating or measuring device that is a high-activity source;
c) a sealed radioactive source not provided in paragraphs a or b for which the ratio of its current activity and D-value is less than 10 and simultaneously equal to or greater than 1;
d) an unsealed radioactive source for which the ratio of the highest processed activity in the workplace and D-value is less than 10 and simultaneously equal to or greater than 1; or
e) A liquid or solid substance containing more than 30 % uranium whose activity exceeds 160 MBq.

(4) A source of ionising radiation of security level 4 refers to

a) a sealed radioactive source designed for brachytherapy with a low dose rate with the exception of an eye applicator or a permanent implant;
b) a sealed radioactive source in an indicating or measuring device that is not a high-activity source;
c) a sealed radioactive source in a radioactive static eliminator;
d) a sealed radioactive source not provided in paragraphs a through c for which the ratio of its current activity and D-value is less than 1 and simultaneously equal to or greater than 0.01; or
e) an unsealed radioactive source for which the ratio of the highest processed activity in the workplace and D-value is less than 1 and simultaneously equal to or greater than 0.01.

(5) A source of ionising radiation of security level 5 refers to

a) an eye applicator and a permanent implant for radiotherapy;
b) a source of ionising radiation for radionuclide X-ray fluorescence analysis;
c) an electron-capture detector;
d) a radioactive source for Mössbauer spectrometry;
e) a calibration source of ionising radiation for positron-emission tomography;
f) a sealed radioactive source for which the ratio of its current activity and D-value is less than 0.01 and simultaneously its current activity is greater than the exemption level; or
g) an unsealed radioactive source for which the ratio of the highest processed activity in the workplace and D-value is less than 0.01 and simultaneously its current activity is greater than the exemption level.

§ 18

(To § 61(6)(b) of the Atomic Act)

(1) In a workplace where radioactive sources are collected, the category of security for the entire set of sources of ionising radiation in the workplace or in the transport package shall be used for the purposes of security.

(2) The security level of the entire set of sources of ionising radiation pursuant to subsection 1 shall be specified on the basis of the A/D aggregate ratio calculated in the following manner:

$$A/D = \sum_{n} \frac{\sum_i A_{i,n}}{D_n},$$

where $A_{i,n}$ refers to activity A of every individual source i of radionuclide n and D_n refers to the D-value for radionuclide n.

Categorisation of workplaces
(To § 61(6)(c) of the Atomic Act)

§ 19

(1) A level I workplace refers to

a) a workplace handling a minor source of ionising radiation whose type is not approved by the Office;
b) a workplace handling a bone densitometer that is not a minor source of ionising radiation;
c) a workplace handling veterinary or dental X-ray devices;
d) a workplace handling a cabin X-ray unit;
e) a workplace handling an indicating or measuring device containing a sealed radioactive source whose character of radiation activity does not require a delineation of the controlled area; and
f) a workplace handling an industrial X-ray device whose character of radiation activity does not require a delineation of the controlled area.

(2) A level II workplace refers to

a) a workplace handling a simple source of ionising radiation that is not classified as a level I workplace;
b) a workplace handling an X-ray device designed for radiodiagnostics or radiotherapy, with the exception of
   1. a bone densitometer;
   2. a dental X-ray device; or
   3. a veterinary X-ray device;
c) a workplace handling a mobile flaw detector containing a sealed radioactive source;
d) a workplace handling a mobile irradiator containing a sealed radioactive source;
e) a workplace handling an indicating or measuring device containing a sealed radioactive source whose character of radiation activity requires a delineation of the controlled area;
f) a workplace handling an industrial X-ray device whose character of radiation activity requires a delineation of the controlled area; and
g) a workplace handling a compact extracorporeal blood irradiator containing a sealed radioactive source.

(3) A level III workplace refers to

a) a workplace handling a particle accelerator;
b) a workplace handling equipment containing a sealed radioactive source that is designed for radiotherapy;

c) an approved stock;
d) a workplace handling equipment containing a sealed radioactive source that is designed for the irradiation of objects, including food and raw materials, objects of common use or other objects; and
e) a workplace where activities related to the extraction of a radioactive mineral are handled with the exception of sanitation and recultivation of storage sites with extractive waste, where mining practices were finished.

(4) A level IV workplace refers to

a) a workplace handling a nuclear installation; and
b) a workplace handling a nuclear waste repository that is not a nuclear installation.

(5) The criterion for the categorisation of a workplace handling an unsealed radioactive source, with the exception of the workplaces provided in subsection 3(e) and subsection 4, consists of providing the workplace with ventilation, insulation and shielding equipment along with drainage. The requirements for standard workplace equipment for the purposes of its categorisation are specified in Annex 9 to this implementing decree.

§ 20

Categorisation of exposed workers
(To § 61(6)(d) of the Atomic Act)

(1) The categorisation of an exposed worker as category A or B shall take into account the following

a) the expected exposure of the exposed worker under normal operations; and
b) the potential exposure of the exposed worker.

(2) Category A exposed worker refers to an exposed worker who could be exposed

a) to an effective dose exceeding 6 mSv per year,
b) to an equivalent dose exceeding 15 mSv per the eye lens; or
c) to an equivalent dose exceeding 3/10 of the exposure limit for the skin and the extremities.

(3) Category B exposed worker refers to exposed workers other than those provided in subsection 2 provided that the Atomic Act requires their categorisation.

Part 4
Quantities and facts relevant to radiation protection

§ 21

List of quantities and facts relevant to radiation protection
(To § 25(2)(a) of the Atomic Act)

(1) Quantities relevant to radiation protection refer to the quantities

a) used to determine an individual dose for an individual;
b) characterising the field of ionising radiation and the occurrence of radionuclides in the workplace;
c) characterising the effluents of radionuclides into the environment of the workplace;
d) characterising the field of ionising radiation and the occurrence of radionuclides in the environment of the workplace;
e) used to evaluate the characteristics of a source of ionising radiation;

f) characterising the source of ionising radiation; and
g) used to evaluate exposure from a natural source of radiation.

(2) Facts relevant to radiation protection refer to the following

a) characteristics of a source of ionising radiation;
b) protective characteristics of personal protective equipment and other protective aids and equipment intended for work with a source of ionising radiation;
c) characteristics of packaging for the carriage, storage or deposit of radioactive or fissile material;
d) characteristics of accessories relevant to radiation protection;
e) facts demonstrating the type approval in the case of a source of ionising radiation subject to type approval;
f) facts provided in the certificate of a sealed radioactive source;
g) facts provided in the accompanying document for an unsealed radioactive source;
h) information on the employed methods and monitoring of the persons, workplace, workplace environment and effluents along with results of such monitoring;
i) facts demonstrating the familiarisations of an exposed worker with the risk of their work;
j) facts demonstrating the instruction of natural persons entering the controlled area;
k) facts demonstrating the testing of an exposed worker's knowledge of the safe management of a source of ionising radiation and an exposed worker's' competence in this respect by regular testing;
l) conclusions of prophylactic medical check-ups to verify the medical fitness of category A exposed workers;
m) facts demonstrating a failure to adhere to requirements for radiation protection discovered within the framework of systematic surveillance;
n) data concerning exposed worker, workplaces and the results of the exposed worker individual monitoring of s;
o) data recorded in the personal radiation passport;
p) data on the entry and period of stay of individuals in the controlled area;
q) results of the inventory of sealed radioactive sources; and
r) facts stated in measurement reports issued by the licensee pursuant to § 9(2)(h)(2) and (5) through (7) of the Atomic Act.

§ 22

Scope of monitoring, measurement, evaluation, verification and recording of quantities and facts relevant to radiation protection

(To § 25(2)(b) of the Atomic Act)

(1) The characteristics of a source of ionising radiation shall be monitored, measured, evaluated, verified and recorded

a) during production, import or distribution within the scope necessary for
   1. the assessment of the conformity of a source of ionising radiation with the approved type;
   2. the assessment of the compliance of a source of ionising radiation with the requirements imposed by the applicable technical regulations;
   3. the issuance of a certificate for a sealed radioactive source; or
   4. the issuance of an accompanying document for an unsealed radioactive source;
b) upon the takeover of a source of ionising radiation and before the commencement of its use in the form of an acceptance test; and

c) during the use of a source of ionising radiation in the form of
   1. a test of long-term stability; and
   2. a test of operational reliability.

(2) The facts demonstrating type approval, facts recorded in the certificate of a sealed radioactive source and facts recorded in the accompanying document for an unsealed radioactive source shall be recorded within the scope necessary for keeping records on sources of ionising radiation.

(3) The facts demonstrating the familiarisations of an exposed worker with the risk related to their work and facts demonstrating the instruction of natural persons entering the controlled area shall be monitored and recorded within the scope specified by § 50, and data on entries and periods of stay of individuals in the controlled area shall be monitored and recorded within the scope specified by § 33(3).

(4) The facts demonstrating the testing of an exposed worker's’ knowledge of the safe management of a source of ionising radiation and their competence in this respect by regular testing shall be monitored and recorded within the scope specified by § 50.

(5) The data recorded in the personal radiation passport shall be monitored, evaluated and recorded within the scope specified by § 36.

(6) The results of the inventory of sealed radioactive sources shall be recorded within the scope specified by § 41.

Facts provided in the certificate of a sealed radioactive source

§ 23

(To § 25(2)(b) of the Atomic Act)

The facts provided in the certificate of a sealed radioactive source shall be recorded within the following scope:
a) the identification number of the certificate of the sealed radioactive source;
b) the serial or identification number of the sealed radioactive source;
c) the manufacturer and the country of origin of the sealed radioactive source;
d) the designation of the approved type with whose characteristics the characteristics of the sealed radioactive source are in conformity;
e) data on the radionuclide type;
f) data on the activity of the sealed radioactive source along with the date that the activity is related to, and data on the highest content of the basic radionuclide;
g) in the case of a significant source of ionising radiation, the kerma rate in the air along with the date that the kerma rate is related to;
h) data on the chemical and physical form of the radionuclide and its carrier;
i) data on the dimensions of the sealed radioactive source;
j) data on sealing in a capsule or protective cover;
k) the grade of resistance of the sealed radioactive source compared to the approved type;
l) the results of the performed tests of radioactive contamination and the tightness of the sealed radioactive source;
m) the recommended time of use for the sealed radioactive source;
n) the date of issue of the certificate of the sealed radioactive source; and
o) identification details of the person who issued the certificate of the sealed radioactive source, and the signature of authorised this person’s representative.

§ 24

(To § 25(2)(b) of the Atomic Act)

In the case of a sealed radioactive source that cannot be designated with a mark and a serial number and that is not a high-activity source, for all sealed radioactive sources of the same type and of the same size containing the same quantity of the same radionuclides managed by the same person, facts provided in the certificate of the sealed radioactive source shall be recorded within the following scope:

a) the identification number of the certificate of the sealed radioactive source;
b) the number of sealed radioactive sources of the same licensee;
c) the designation of the approved type with whose characteristics the characteristics of the sealed radioactive source are in conformity;
d) information on the radionuclide type;
e) information on the activity of the sealed radioactive sources along with the specification of the date that the activity is related to;
f) information on the highest content of the basic radionuclide in the sealed radioactive sources;
g) data on the chemical and physical form of the radionuclide and its carrier;
h) data on the dimensions of the sealed radioactive sources;
i) data on sealing in a capsule or protective cover;
j) the grade of resistance of the sealed radioactive sources compared to the approved type;
k) the results of the performed tests of radioactive contamination and the tightness of the sealed radioactive sources;
l) the recommended time of use of the radioactive sources and other data for the planned verification of their tightness; and
m) the date of issue of the certificate of the sealed radioactive sources and the identification details of the person who issued the certificate of the sealed radioactive sources, and the signature of the person’s authorised representative.

§ 25

Facts provided in the accompanying document for an unsealed radioactive source

(To§ 25(2)(b) of the Atomic Act)

(1) The facts provided in the accompanying document for an unsealed radioactive source shall be recorded within the following scope:

a) the identification number of the accompanying document for the unsealed radioactive source;
b) the specification or identification number of the unsealed radioactive source;
c) in the case of an unsealed radioactive source subject to the approval of the type, the designation of the approved type with whose characteristics the characteristics of the unsealed source are in conformity;
d) information on the radionuclide type;
e) data on the chemical and physical form of the radionuclide and its carrier;
f) data on the activity and activity weight concentration of the unsealed radioactive source along with the specification of the time that the data are related to;
g) data on chemical and radiochemical purity, if available;
h) data on the type of package of the unsealed radioactive source;
i) date of issue of the accompanying document for the unsealed radioactive source;
j) changes in the facts provided in paragraphs d through i; and

k) identification details of the person who issued the accompanying document for the unsealed radioactive source, and the signature of the authorised person's representative.

(2) For the same radioactive sources handed over together, the facts provided in the accompanying document for an unsealed radioactive source shall be recorded within the scope specified in subsection 1, and for each radionuclide or for each mixture of radionuclides a total number of handed-over unsealed radioactive sources shall be specified.

(3) If objects or substances contaminated by radionuclides from a nuclear installation or workplace during the operation of which radionuclides are generated or concentrated are handed over to a different person, the facts stated in the accompanying document for an unsealed radioactive source shall be recorded within the following scope:

a) data pursuant to subsection 1(a), (b), (d), (h), (i) and (k),
b) data on activity and the highest ambient dose equivalent rate at a distance of 0.1 m from the surface; and
c) data on the highest surface activity per 100 cm^2 of the surface in the case of surface contamination by radionuclides.

Part 5
Tests of a source of ionising radiation

§ 26

Acceptance test
(To § 68(2)(a) and § 69(2)(c) of the Atomic Act)

(1) The acceptance test shall be performed after the installation of a source of ionising radiation before the commencement of its use.

(2) The acceptance test shall include

a) a visual check of the integrity and undamaged state of the source of ionising radiation;
b) in the case of an unsealed radioactive source, the verification of data provided in the accompanying document for the unsealed radioactive source issued by the manufacturer pursuant to § 25(1)(a) and (b),
c) in the case of a sealed radioactive source
   1. the verification of data provided in the certificate of a sealed radioactive source; and
   2. the test of the tightness, including the determination of measurement uncertainty; the scope and method of the performance of the tightness test for a sealed radioactive source is specified in Annex 10 to this implementing decree;
d) in the case of equipment with a sealed radioactive source
   1. the verification of the functionality of the equipment with the sealed radioactive source;
   2. the verification of the functionality of the control, actuating, safety, alarm and indicating systems;
   3. the verification of the operating parameters and characteristics of the equipment with the sealed radioactive source;
   4. the determination of dosimetric quantities relevant in respect of the purpose of the use of such equipment, including their deviations in the case of radiotherapy;
   5. the test of the tightness for a sealed radioactive source bay smear test on a substitute surface, including the determination of the measurement uncertainty; the scope and method of the performance of the smear test on a substitute surface are specified in Annex 10 to this implementing decree; and

   6. the measurement or estimate of stray radiation in the environment of the equipment containing a sealed radioactive source;
e) in the case of a radiation generator
   1. the verification of the radiation generator functionality;
   2. the verification of the functionality of the control, actuating, safety, alarm, indicating and imaging systems;
   3. the verification of the operating parameters and characteristics of the radiation generator;
   4. the determination of dosimetric quantities relevant in respect of the purpose of use of the radiation generator, including their deviations in the case of radiotherapy; and
   5. the measurement of stray radiation in the environment of the radiation generator or estimate thereof, if a dental intraoral or a dental panoramic X-ray device is concerned; and
f) the verification of data provided by the manufacturer that is significant to radiation protection in respect of the possible method of the equipment use, or in case that this is not possible in the standard operating mode the verification that such a verification was done by the person that installed the source of ionising radiation.

(3) In the case of a source of ionising radiation subject to type approval, the acceptance test shall be performed within the scope specified in subsection 2 and the decision on approval of the type of product.

(4) The person performing the acceptance test shall adapt its scope to the specific purpose of the use and specific characteristics of the source of ionising radiation and its accessories that are relevant to radiation protection.

§ 27

Status test

(To § 68(2)(a) of the Atomic Act)

(1) The status test shall be performed

a) regularly, with a minimum frequency
   1. once every 12 months in the case of a source of ionising radiation designed for medical exposure in radiotherapy;
   2. once every 12 months in the case of a significant source of ionising radiation designed for medical exposure in radiodiagnostics or interventional radiology;
   3. once every 12 months in the case of a mobile flaw detector with a sealed radioactive source;
   4. specified in Annex 11 to this implementing decree in the case of a sealed radioactive source that is not part of equipment with a sealed radioactive source or that can be removed from such equipment to carry out an independent test of long-term stability;
   5. once every 24 months in the case of a significant source of ionising radiation not stated in paragraphs 1 through 4; and
   6. once every 36 months in the case of a simple source of ionising radiation not stated in paragraphs 1 through 4;
b) if there is a reasonable suspicion of the improper functionality of the source of ionising radiation or its accessories relevant to radiation protection;
c) if there is a suspicion of leakage of the sealed radioactive source;
d) if the results of operational reliability tests indicate or demonstrate the improper functionality of the source of ionising radiation or its accessories relevant to radiation protection;

e) after maintenance, repair or other service intervention that is significant form the radiation safety perspective and could affect any characteristic verified during the test of long-term stability or any parameter verified during thereof, especially after the renewal of the X-ray tube, image receptor, after the servicing of the collimation or other exposure geometry systems or after repair of the automatic exposure control or of the generator;
f) after the replacement of the accessories of the source of ionising radiation relevant to radiation protection; and
g) after the removal of any defect discovered during the test of long-term stability.

(2) The test of long-term stability performed according to subsection 1(a) shall be carried out no later than in the calendar month in the course of which the time limit for the test performance expires.

§ 28

(To § 68(2)(a) and § 69(2)(c) of the Atomic Act)

(1) The test of long-term stability shall include a visual check of the integrity and undamaged state of the source of ionising radiation and in the case of

a) a sealed radioactive source
   1. the verification of data provided in the certificate of a sealed radioactive source; and
   2. the test of the tightness, including the determination of measurement uncertainty; the scope and method of the performance of a tightness test for a sealed radioactive source is specified in Annex 10 to this implementing decree;
b) equipment with a sealed radioactive source
   1. the verification of the functionality of the equipment with the sealed radioactive source;
   2. the verification of the functionality of the control, actuating, safety, alarm and indicating systems;
   3. the verification of the operating parameters and characteristics of the equipment with the sealed radioactive source and stability thereof;
   4. the determination of dosimetric quantities relevant in respect of the purpose of such equipment, the verification of their stability, and their deviations in the case of radiotherapy;
   5. the test of the tightness for a sealed radioactive source by a smear test on a substitute surface, including the determination of measurement deviation; the scope and method of the performance of the smear test on a substitute surface are specified in Annex 10 to this implementing decree; and
   6. the measurement or estimate of stray radiation in the environment of the equipment with the sealed radioactive source in the case of a change in its use that could affect the values provided in the last measurement or an estimate of stray radiation;
c) a radiation generator
   1. the verification of the functionality of the radiation generator;
   2. the verification of the functionality of the control, actuating, safety, alarm, indicating and imaging systems;
   3. the verification of the operating parameters and characteristics of the radiation generator and their stability;
   4. the determination of dosimetric quantities relevant in respect of the purpose of the radiation generator, the verification of their stability, and their deviations in the case of radiotherapy; and
   5. the measurement of stray radiation in the environment of the radiation generator or in the case of a dental intraoral or dental panoramic X-ray device, its estimate, if a

change in its use that could affect the values provided in the last measurement or estimate of stray radiation occurred;

d) a source of ionising radiation subject to type approval, the tests within the scope defined in the decision on the product type; and

e) the test of long-term stability after replacement of the accessories of a source of ionising radiation affecting radiation protection, the verification of the correctness of the data provided in technical documentation for such accessories that are relevant to the common use of the source of ionising radiation or its accessories from the point of view of radiation protection.

(2) The person performing the test of long-term stability shall adapt its scope to the specific purpose of the use and specific characteristics of the source of ionising radiation and its accessories that are relevant to radiation protection.

§ 29

(To § 68(2)(a) of the Atomic Act)

(1) The test of long-term stability performed pursuant to § 27(1)(b) through (g) can be performed within a limited scope so that in the case pursuant to

a) § 27(1)(b), any suspicion of the improper functionality of the source of ionising radiation or its accessories relevant to radiation protection is either confirmed or disproved;

b) § 27(1)(c), any suspicion of the leakage of the sealed radioactive source is either confirmed or disproved;

c) § 27(1)(d), the characteristics of the source of ionising radiation or its accessories relevant to radiation protection that can be related to the results of the test of operational reliability can be verified;

d) § 27(1)(e), the characteristics and parameters verified during the test of long-term stability that could be affected by maintenance, repair or service intervention can be verified;

e) § 27(1)(f), the characteristics and parameters verified during the test of long-term stability that could be affected by the replacement of the accessories of the source of ionising radiation relevant to radiation protection can be verified; and

f) § 27(1)(g), it can be verified whether
   1. any defects discovered during the previous test of long-term stability have been removed; and
   2. that no new defect resulted from the removal of such a defect.

(2) The test of long-term stability carried out within the limited scope pursuant to subsection 1 (hereinafter referred to as "partial test of long-term stability") cannot replace the test of long-term stability pursuant to § 27(1)(a).

§ 30

Evaluation of the test of long-term stability and removal of defects

(To § 68(2)(g) of the Atomic Act)

(1) Any defects discovered during the test of long-term stability are categorised as very significant or less significant. The rules of the categorisation of defects discovered during the test of long-term stability are specified in Annex 12 to this implementing decree.

(2) The test of long-term stability is regarded as successful

a) if no defects are discovered during the test;

b) for the period until the expiry of the time limit for the removal of a less significant defect discovered during the test of long-term stability; or
c) if no defects were discovered during the partial test of long-term stability executed pursuant to § 29(1)(f).

(3) The test of long-term stability is regarded as unsuccessful if

a) a very significant defect was discovered during the test; or
b) a less significant defect failed to be removed within the time limit or its removal failed to be confirmed within the time limit by a successful test of long-term stability or a successful partial test of long-term stability.

(4) If a very significant defect is discovered during the test of long-term stability, the person who performs the test shall immediately inform the licensee or the registrant or the clinical medical physics expert, if his availability is requested by a special regulation, of this fact in writing and state this fact in the report of the test of long-term stability.

(5) The time limit for the removal of a less significant defect shall be specified by the person who performs the test of long-term stability during which such a defect was discovered. This person must

a) inform the license holder or the registrant and the medical physicist expert, if he is requested by the other law, about the defect and about the related operating restrictions immediately after finding the defect, and
b) write them into the protocol of the test of the long-term stability.

(6) When determining the time limit for the removal of a less significant defect, the character of the discovered less significant defect and the method of common use of the source of ionising radiation and its accessories relevant to radiation protection shall be taken into account.

(7) The time limit for the removal of a less significant defect shall not exceed three months and shall start running as of the date of execution of the test of long-term stability during which such a defect was discovered.

Test of operational reliability

§ 31

(To§ 68(2)(b) and (c) and § 69(2)(c) of the Atomic Act)

(1) The registrant shall execute tests of operational reliability within the scope and with frequency provided in Annex 13 to this implementing decree.

(2) The licensee shall specify the scope and frequency of operational reliability tests to cover

a) a visual check of the integrity and undamaged state of the source of ionising radiation;
b) the verification of the characteristic operating parameters and characteristics of the source of ionising radiation and its accessories relevant to radiation protection
    1. regularly with the frequency corresponding with the influence of the tested quality to the normal operation,
    2. after every reasonable suspicion on the wrong function of the, especially after change of the images during the normal imagining, after the change of the dose indications of after the suspicion on the change in geometry or collimation of the radiation beam,
    3. after the maintenance, repair or other servicing relevant to radiation protection that could significantly influence the quality that is checked during the test of operational

stability, especially after the repair or calibration of the diagnostic monitor, after the change in the software of the digitisation of the image or after the reprograming of the exposure protocols, and
   4. the change of the accessories of the source ionising radiation relevant to radiation protection, and
c) in the case of a sealed radioactive source or equipment, the test of the tightness of a sealed radioactive source, namely
   1. regularly, at least once every 12 months;
   2. if used in a chemically aggressive environment or where there is an increased risk of mechanical damage, at least once every three months;
   3. upon every cleaning; and
   4. after the suspicion on the untightenss of the sealed radioactive source.

(3) The scope and method of the performance of a tightness test for a sealed radioactive source is specified in Annex 10 to this implementing decree.

(4) When determining the scope and frequency of tests of operational reliability, the licensee shall take into account

a) the condition of the source of ionising radiation and its accessories relevant to radiation protection;
b) the common methods of use and operation of the source of ionising radiation and its accessories relevant to radiation protection;
c) the scope and frequency of such tests, which are
   1. specified in the manufacturer's instructions;
   2. provided in the decision on the type approval for the source of ionising radiation; or
   3. specified in the report of the acceptance test or test of long-term stability; and
d) rules of good practice ensuring radiation protection when using the source of ionising radiation.

§ 32

(To§ 68(2)(d) through (f) of the Atomic Act)

(1) Tests of operational reliability for a source of ionising radiation used for medical exposure shall be performed

a) in case of tests with a frequency greater than once a month by
   1. a physician who commonly describes X-ray images on the monitor within the framework of clinical practice, provided that a test of operational reliability consisting in the inspection of the respective diagnostic monitor in radiodiagnostics is concerned; or
   2. a radiology assistant who uses the source of ionising radiation in clinical practice, provided that a test of operational reliability of the source of ionising radiation used in computed tomography is concerned;
b) in case of tests with a frequency equal to or greater than once a month by
   1. a healthcare professional who uses the source of ionising radiation in clinical practice, provided that a test of operational reliability of the source of ionising radiation used in interventional radiology, dental radiodiagnostics, fluoroscopy or bone densitometry is concerned; or
   2. a radiology assistant who uses the source of ionising radiation in clinical practice, provided that a test of operational reliability of the source of ionising radiation used

in mammography, or fluorography not consisting in the inspection of the respective diagnostic monitor in radiodiagnostics is concerned; and

c) by a radiology assistant who uses the source of ionising radiation in clinical practice, a radiology technician or medical physics expert, provided that a test of operational reliability of the source of ionising radiation used in radiotherapy is concerned.

(2) The person obliged to ensure the verification of the characteristics of the source of ionising radiation by a test of operational reliability, the continuous evaluation of the results of such a test, and in the case of unsatisfactory results the implementation of corrective measures, refers to

a) a clinical medical physics expert, provided that their availability is required according to a different legal regulation; or
b) unless the availability of a clinical medical physics expert is required pursuant to a different legal regulation;
   1. a supervisor, provided that the source of ionising radiation is managed by the licensee; or
   2. the person providing for radiation protection for the registrant, provided that the source of ionising radiation is managed by the registrant.

(3) The person obliged to determine the scope and frequency of tests of operational reliability for the licensee refers to

a) a clinical medical physics expert, provided that their availability is required according to a different legal regulation; or
b) a supervisor, unless the availability of a clinical medical physics expert is required pursuant to a different legal regulation.

(4) Evaluation of the results of the test of operational reliability shall be

a) carried out immediately after the test performance;
b) recorded in writing; and
c) immediately submitted to the person specified in subsection 2.

(5) If, based on the results of the test of operational reliability, any corrective measures have been implemented, all workers using the source of ionising radiation in common operation shall be informed of the corrective measures arising therefrom.

Part 6
Keeping records

§ 33

Keeping records on individual doses by the licensee

(To § 25(2)(b) and (c) of the Atomic Act)

(1) The licensee shall keep the following records in the register of individual doses of category A exposed workers:

a) surname;
b) name, or names where applicable;
c) personal identification number, if assigned, or date of birth;
d) the magnitude of individual doses and other information related to individual doses received from the licensee for the performance of individual dosimetry; and
e) information characterising exposure specified in the monitoring programme.

(2) The information pursuant to subsection 1 shall be kept on file throughout the time a work activity involving ionising radiation exposure is performed, and subsequently until the time when the exposed worker reaches or would have reached 75 years of age, however no shorter than 30 years after the termination of the work activity during which the exposed worker was exposed to ionising radiation.

(3) The controlled-area operator shall record any entry of individuals who are not category A exposed workers into the controlled area, except of individuals undergoing a medical or non-medical exposure or voluntarily helping to other person undergoing a medical exposure in the controlled area. The following records shall be kept about the entering individual on file in respect of the registration of entry into the controlled area:

a) surname;
b) name, or names where applicable;
c) date of birth;
d) time of stay;
e) results of individual monitoring, provided that such results are available; and
f) a conservative estimate of the effective dose unless the information pursuant to paragraph e is available.

(4) The information pursuant to subsection 3 shall be kept on file by the controlled-area operator for 10 years.

(5) Individual doses from extraordinary exposure and from emergency exposure shall be recorded independently.

(6) The licensee shall submit to the Office the following information on the exposure of exposed workers:

a) personal data of category A exposed workers and data characterising their expected exposure within one month as of the commencement of the work activity during which the exposed worker is exposed to ionising radiation, and upon any change in such data; the list of this data is specified in Annex 14 to this implementing decree;
b) data on the individual doses for all category A exposed workers within two months of the end of a monitoring period; and
c) an annual summary of the individual doses for all category A exposed workers by 31 March of the current year for the preceding year.

(7) The information pursuant to subsection 6 shall be submitted to the Office in a machine-readable electronic format allowing database processing.

(8) The licensee shall immediately submit to the Office the following information on

a) effective doses from external exposure exceeding a value of 10 mSv or effective doses per the eye lens from external exposure exceeding 10 mSv or the equivalent dose of 150 mSv for the extremities or the skin, attained over the monitoring period or on a one-time basis, along with an evaluation of the causes of such a situation and conclusions reached;
b) effective doses from external exposure exceeding a value of 15 mSv or effective doses per the eye lens from external exposure exceeding 15 mSv or the equivalent dose of 300 mSv for the extremities or the skin, attained by summing up the doses received in individual monitoring periods, along with an evaluation of the causes of such a situation and conclusions reached; and

c) the committed effective dose from internal exposure exceeding 6 mSv, on a one-time as well as summary basis, along with the evaluation of the causes of such a situation and conclusions reached.

(9) The notification pursuant to subsection 8(a) or (b) shall be carried out also in the case that the dosimeter detecting exceeding of the equivalent dose was placed on the protective apron. The attenuation caused by the apron shall be taken into account within the framework of the evaluation of the causes of such a situation.

§ 34

Keeping records on individual doses by the licensee to carry out individual dosimetry

(To § 25(2)(b) and §78(3)(a) of the Atomic Act)

(1) To carry out individual dosimetry, the licensee shall keep records on individual doses of category A exposed workers at least for the whole calendar year following the year in which the record was made.

(2) To carry out individual dosimetry, the licensee shall submit the results of the evaluation of category A exposed workers' exposure to the licensee for whom individual dosimetry was carried out and to the Office, immediately upon

a) the evaluation of the dosimeter due to unplanned single exposure;
b) a discovery of
   1. an effective dose from external exposure exceeding 10 mSv,
   2. an equivalent dose from external exposure exceeding 10 mSv for the eye lens or 150 mSv for the extremities or the skin; or
   3. the committed effective dose from internal exposure exceeding 6 mSv.

(3) To carry out individual dosimetry, the licensee shall inform the Office within one month of the date of effect or expiry of the contract on the execution of individual dosimetry concluded with the licensee being a holder of a licence to manage a source of ionising radiation.

(4) To carry out individual dosimetry, the licensee shall inform the Office within one month of the end of the monitoring period, the name and surname of exposed worker category A, than has not been evaluated personal dose from assigned personal dosimeter and identification of licensee witch this exposed worker by dosimeter equipped.

Personal radiation passport

§ 35

(To § 79(9) of the Atomic Act)

(1) The person obliged to ensure radiation protection for an outside worker shall apply to the Office to issue a personal radiation passport before this worker starts performing radiation activities. The applicant shall attach a photograph with dimensions 3.5 × 4.5 cm to the application for the issuance of a personal radiation passport.

(2) The personal radiation passport consists of the following

a) part A, intended for continuous records on doses and valid until exhausted, however, no later than 10 years as of the issue of the personal radiation passport; and
b) part B, intended for records on doses in the current calendar year and valid for the current year.

(3) The validity of the personal radiation passport shall expire

a) upon the outside worker's death; or
b) upon the expiry of the licence, if the outside worker is also the licensee.

(4) A specimen of the personal radiation passport is specified Annex 15 to this implementing decree.

§ 36

(To § 79(9) of the Atomic Act)

(1) The person obliged to ensure radiation protection for an outside worker shall

a) apply to the Office for a new part B of the personal radiation passport no later than by 30 November of the preceding calendar year,
b) submit to the Office no later than by 28 February of the subsequent calendar year part B of the personal radiation passport where all doses received by an outside worker in the previous calendar year are recorded along with the total annual individual dose evaluated and confirmed by the licensee who applied for the issue of the personal radiation passport;
c) immediately inform the Office of a loss of the personal radiation passport;
d) immediately apply to the Office for the issuance of a new personal radiation passport in the case of loss of the personal radiation passport and complete all details from the lapse personal radiation passport in the newly issued one;
e) submit part A of the personal radiation passport to the Office upon its exhaustion;
f) apply to the Office for the issue of a new personal radiation passport no later than 30 days before the expected expiry of the personal radiation passport's validity;
g) submit the personal radiation passport to the Office no later than 30 days after the termination of the outside worker's employment or the termination of the person's own activity if the person obliged to ensure radiation protection is the outside worker;
h) inform the Office of any change in details provided in paragraphs 1, 7 or 8 of part A of the personal radiation passport and submit the personal radiation passport to the Office to record such changes;
i) record in part A of the personal radiation passport doses received for the previous four-year period so that it is always possible to monitor the five-year total individual dose of the outside worker;
j) record in part B of the personal radiation passport, which was issued in the course of a calendar year, all individual doses received by an outside worker until the issue of the personal radiation passport so that it is possible to evaluate the total annual individual dose received by the outside worker;
k) record in part B of the personal radiation passport the monthly summaries of individual doses received by the outside worker, including the results of monitoring from all controlled-area operators for whom the outside worker performed work activity in the calendar month concerned;
l) record in part A of the personal radiation passport total individual annual doses received by the outside worker;
m) record in the personal radiation passport the results of the outside worker's medical check-up performed pursuant to § 80(4) of the Atomic Act; and
n) make a record on instructions and preparation of the outside worker pursuant to § 50.

(2) The operator of the controlled area where the outside worker performs work activity shall ensure in accordance with the monitoring programme for the operator's controlled area an evaluation of the individual dose received by the outside worker when performing work

activity in the operator's controlled area. The operator of the controlled area shall record the evaluated dose on a continuous basis, however, no later than at monthly intervals in part B of the personal radiation passport of the outside worker.

(3) If the operator of the controlled area pursuant to subsection 2 does not have all results of measurement before the completion of the outside worker's activity in the operator's controlled area, the operator shall submit such results immediately upon the evaluation of the dose to the person obliged to ensure radiation protection for the outside worker.

§ 37

Keeping records on other quantities and facts relevant to radiation protection

(To § 25(2)(b) and (c) of the Atomic Act)

(1) The licensee being a holder of the licence to manage a source of ionising radiation pursuant to § 9(2)(f)(8) of the Atomic Act and to provide services relevant to radiation protection pursuant to § 9(2)(h)(2) and (5) of the Atomic Act shall submit to the Office within one month of the execution of measurement, evaluation or determination a report of the results for

a) the measurement and evaluation of the characteristics of a source of ionising radiation;
b) the measurement to determinate an individual doses for an worker; or
c) the measurement and evaluation of exposure from a natural source of radiation.

(2) The documents demonstrating the conclusions of prophylactic medical check-ups to attest to category A exposed worker's' medical fitness shall be kept on file until the time when an exposed worker reaches or would have reached 75 years of age, however no shorter than 30 years after the termination of the work activity during which the exposed worker was exposed to ionising radiation.

(3) The results of the monitoring of a level IV workplace, being a workplace handling a nuclear installation, shall be kept on file for a period of

a) the operation of such a workplace;
b) the decommissioning of such a workplace; and
c) 10 years after the workplace was decommissioned.

(4) Unless this implementing decree or the implementing decree on radiation situation monitoring provides otherwise, quantities and facts relevant to radiation protection shall be kept on file for 10 years.

Keeping records on sources of ionising radiation by a licensee and registrant

§ 38

(To§ 25(2)(d) of the Atomic Act)

(1) A licensee or registrant shall keep the following documents and records on each source of ionising radiation that they manage:

a) a description of the source of ionising radiation enabling the source's' unambiguous identification, including namely its name, type designation, manufacturer's' name, serial or identification number;
b) the purpose of the management of sources of ionising radiation;
c) licences and other decisions concerning the management of ionising radiation sources;

d) operational records characterising the method and scope of the management of a source of ionising radiation; and for an unsealed radioactive source, its purpose and consumption balance; and
e) records concerning the management of a source of ionising radiation acquired within the framework of systematic surveillance of radiation protection, and records of inspection activities.

(2) A licensee or registrant shall also keep the following documents and records on each source of ionising radiation that they possess:

a) the date of physical acceptance of the source of ionising radiation;
b) a document attesting to the acquisition of the source of ionising radiation;
c) for a source of ionising radiation that is subjected to type approval, with the exception of a radioactive source, the declaration of conformity issued by its manufacturer, importer or distributor;
d) in the case of a sealed radioactive source, the certificate of the sealed radioactive source;
e) in the case of an unsealed source, the accompanying document issued upon the transfer of the source by its previous owner;
f) the report of the acceptance test and reports on tests of long-term stability if such tests are required for the source of ionising radiation;
g) records with the results of measurements performed within the framework of tests of operational reliability and images resulting from the performance thereof;
h) if the source of ionising radiation is transferred to be possessed by a different person, the information on to whom and when the source was handed over, and in the case of an unsealed radioactive source also the accompanying document issued for such a transfer;
i) if the radioactive source is subject to clearance from the workplace, records made on its clearance from the workplace;
j) if the radioactive source is disposed of as radioactive waste, a record on to whom and where it was handed over along with the accompanying document for radioactive waste issued for such handover; and
k) for a high-activity source, a photograph or similar representation if provided so by the Atomic Act.

(3) A report of the acceptance test shall be kept on file over the period of the use of the source of ionising radiation.

(4) A report of the test of long-term stability shall be kept on file until the next test of long-term stability is performed, however, at least for three years as of the performance of the test of long-term stability. If the test of long-term stability included the measurement or estimate of stray radiation in the environment of the source of ionising radiation, the report of this test of long-term stability shall be kept on file for the entire period of operation of the source of ionising radiation.

(5) A record containing the results of measurements executed within the framework of operational reliability tests and images resulting from such tests shall be kept on file until the next test of long-term stability; however, at least for one year as of their acquisition.

(6) Unless this implementing decree provides otherwise, the information pursuant to subsections 1 and 2 shall be kept on file at least for two years from the termination of the management of the source of ionising radiation.

§ 39

(To§ 25(2)(d) of the Atomic Act)

(1) The holder of the licence to manage a source of ionising radiation and the registrant shall submit to the Office written information on the source of ionising radiation that they possess with the exception of a non-significant source of ionising radiation and a minor source of ionising radiation whose type was approved by the Office, namely on

a) a radiation generator no later than within one month of
   1. the successful completion of the acceptance test;
   2. a change in the information;
   3. transfer to the possession of a different person; and
   4. decommissioning;
b) a sealed radioactive source no later than within one month of
   1. the physical takeover of a sealed radioactive source;
   2. a change in the information;
   3. transfer to the possession of a different person; and
   4. disposal thereof as radioactive waste or different disposal thereof; and
c) equipment with a sealed radioactive source no later than within one month of
   1. the successful completion of the acceptance test;
   2. a change in the information;
   3. equipment transfer to the possession of a different person; and
   4. equipment decommissioning.

(2) The scope of information submitted to the Office pursuant to subsection 1 is provided by Annex 16 to this implementing decree.

(3) The holder of the licence to manufacture, import, distribute or export a source of ionising radiation and the registrant shall submit to the Office a written list summarising the manufactured, imported, distributed or exported sources of ionising radiation for the previous calendar quarter no later than within one month of the end of the quarter. The scope of submitted information is specified in Annex 17 to this implementing decree.

§ 40

Keeping records on sources of ionising radiation by a registrant

(To § 71(2) of the Atomic Act)

(1) The registrant shall make and keep the following records on a source of ionising radiation:

a) a description of the source of ionising radiation enabling the source's' unambiguous identification, including namely its name, type designation, manufacturer's' name, serial or identification number;
b) the purpose of the use of the source of ionising radiation; and
c) information contained in the instructions for use of the source of ionising radiation.

(2) The registrant shall also keep the following records on a source of ionising radiation:

a) the date of physical acceptance of the source of ionising radiation;
b) information on the method of acquisition of the source of ionising radiation;
c) information contained in the declaration of conformity issued by the manufacturer, importer or distributor of the source of ionising radiation;
d) for a sealed radioactive source, the information provided in the certificate of the sealed radioactive source;
e) for an unsealed radioactive source, the information provided in the accompanying document for the unsealed radioactive source; and

f) information on the location of the source of ionising radiation.

(3) The registrant shall keep the records pursuant to subsections 1 and 2 for at least two years from the transfer of the source of ionising radiation to a different person or from its disposal.

§ 41

Inventory of sources of ionising radiation

(To § 69(2)(b) of the Atomic Act)

(1) Inventory inspection shall be executed for sealed radioactive sources that are simple sources of ionising radiation or significant sources of ionising radiation.

(2) Inventory inspection shall be performed

a) on an annual basis, as of 31 March;
b) immediately upon the declaration of the licensee's bankruptcy; and
c) at least once a month in the case that a high-activity source that is part of a technological unit has not been used for a period exceeding 30 days.

(3) Inventory inspection shall be performed within the following scope:

a) in the case pursuant to subsection 2(a) or (b)
   1. the verification of documents related to a sealed radioactive source; and
   2. the verification of the physical presence of a sealed radioactive source in the shield;
b) in the case pursuant to subsection 2(c), the verification of the physical presence of a sealed radioactive source in the shield.

(4) The licensee shall submit to the Office, by the end of the month following the performed inventory inspection pursuant to subsection 2(a) or (b), a report containing

a) the serial number of the sealed radioactive source, the number of the certificate of the sealed radioactive source and information on the radionuclide type;
b) information on the type of shield in which the radioactive source is placed, and its serial number;
c) the designation of the area or part of the technological system where the radioactive source is located; and
d) the date of carrying out the inventory inspection.

(5) The licensee shall record the result of the verification of physical presence of a sealed radioactive source pursuant to subsection 2(c).

§ 42

Identification and designation of a high-activity source

(To § 89(2) of the Atomic Act)

(1) The holder of the licence to manufacture or import a high-activity source shall

a) provide the high-activity source with a unique identifier;
b) engrave, print or mark the identifier on the high-activity source otherwise in a permanent manner, if feasible;
c) engrave, print or mark the identifier on the high-activity source's' container; if this is not possible or in the case of reusable transport containers, the licensee shall provide the container with the characteristics of the high-activity source;

d) provide the container for a high-activity source, and if practicable, the high-activity source with a warning sign about radiation danger; and
e) ensure that the documentation for each manufactured or imported type of high-activity source includes a photograph or any other similar representation of the high-activity source and its usually used container.

(2) A person who possess a high-activity source shall ensure that

a) the high-activity source and its container are always accompanied by written information allowing the high-activity source along with its nature to be identified;
b) the high-activity source and its container are, if practicable, designated and equipped with a sign about radiation danger and that marks and signs remain legible; and
c) the documentation for the high-activity source contains photographs, technical drawings or any other similar representation of the high-activity source, its container, transport container, the equipment that the high-activity source is part of, its accessories; a photograph or any other similar representation may not be provided if it cannot be acquired without dismantling the equipment.

Title II
Planned exposure situations

Part 1
Systematic supervision of radiation protection

§ 43

Supervisor

(To § 72(5)(a) and (b) of the Atomic Act)

(1) The supervisor in the workplace where the controlled area is delineated shall refer to category A exposed workers. In the remaining cases, supervisor refers to category A or B exposed workers.

(2) A supervisor shall perform the supervision of radiation protection

a) by monitoring and evaluating the performance of the licensee's' duties related to ensuring all measures to be taken for
   1. the safe management of the source of ionising radiation;
   2. the performance of radiation activities;
   3. the safe operation of the workplace where radiation activity is performed; and
   4. the decommissioning of the workplace where radiation activity is performed; and
b) by providing assistance to the licensee in relation to
   1. the preparation and implementation of new activities pertaining to the provision of radiation protection; and
   2. the purchase of the source of ionising radiation, protective aids and equipment or measuring devices.

(3) A supervisor shall provide the licensee with, in particular, the following

a) informing an exposed worker and a trainee preparing themselves in the controlled or supervised area for employment of facts relevant to radiation protection;
b) education of exposed workers;
c) preparation of the monitoring programme, the execution of monitoring and evaluation of monitoring results according to the monitoring programme;

d) keeping records on individual doses, including the sum of individual doses from all work activities by exposed workers;
e) determination of an effective dose for a person who entered the controlled area;
f) performing the optimisation of radiation protection and specifying dose constraints;
g) maintaining documentation for the licensed activity, including the management system or the programme for ensuring radiation protection;
h) performing an evaluation of the method for ensuring radiation protection;
i) keeping records on the sources of ionising radiation and instruments relevant to radiation protection and maintaining records on their movement and condition;
j) performing annual inventory inspections of the sources of ionising radiation;
k) organising acceptance tests and tests of long-term stability and cooperation with the person performing such tests;
l) a test of operational reliability, unless this implementing decree provides otherwise;
m) investigation of radiation incidents, loss, theft or damage to the source of ionising radiation and the preparation of proposals for corrective measures and verification of the corrective measures;
n) addressing a radiological event;
o) the monitoring and settlement of a non-conformity that is not a radiation incident in the area of radiation protection;
p) the supervision of ensuring the provision of occupational health services to an exposed worker;
q) operational communication with an exposed worker and a different person, if consultation with them is necessary considering the current radiation situation, so that the information is communicated clearly, in a comprehensible manner and without any undue delay; and
r) the methodological guidance for radiation protection officers and coordination of their activities.

§ 44

Radiation protection officer

(To § 72(5)(c) and (d) of the Atomic Act)

(1) A radiation protection officer in a workplace where the controlled area is delineated shall be a category A exposed worker. In the remaining cases, radiation protection officer refers to category A or B exposed workers.

(2) A radiation protection officer shall supervise the performance of radiation activities in the licensee's workplace on a permanent basis and, in particular,

a) cooperate with the supervisor;
b) plan and prepare working procedures and prepare documents for the activities to be carried out;
c) inform an exposed worker and a different individual of the current situation and measures taken in response to a situation that has occurred;
d) verify whether the exposed worker and the different individual entering the controlled area when performing a radiation activity meet occupational requirements and technical administrative requirements aimed at ensuring radiation protection;
e) participate in the investigation of a radiation incident;
f) participate in the settlement of any non-conformity in the area of radiation protection that is not an incident; and

g) communicate with an exposed worker and other individuals if a consultation with them is necessary considering the current radiation situation, or manage their activities, so that the information is communicated clearly, in a comprehensible manner and without any undue delay.

§ 45

Specialised radiation protection unit ensuring continuous supervision of radiation protection at an energy-generating nuclear installation

(To § 72(5)(e) of the Atomic Act)

(1) A specialised radiation protection unit ensuring continuous supervision of radiation protection at an energy-generating nuclear installation shall ensure at such an installation the activities pursuant to § 43(2) and (3), check the fulfilment of requirements for ensuring radiation protection and ensure in particular the following

a) direct supervision of radiation protection for all individuals entering the controlled area;
b) assessment and taking measures to ensure radiation protection of all individuals entering the controlled area;
c) preparation
   1. of proposals for changes in documentation for the licensed activity related to radiation protection; and
   2. of internal regulations of the licensee related to radiation protection;
d) evaluation of the effect of effluents on the representative person and the inspection of the observance of authorised limits;
e) investigation of events related to radiation protection, including the preparation of proposals for corrective measures to be taken and assistance provided by other departments of the licensee during the implementation of such corrective measures; and
f) coaction with other departments of the licensee when managing a radiation incident.

(2) A specialised radiation protection unit ensuring continuous supervision of radiation protection at an energy-generating nuclear installation, at ensuring continuous supervision of radiation protection of persons performing providing of services to the operator of the IV. category workplace in a controlled area, shall

a) cooperate with a supervisor of a licensee being a holder of the licence to provide services to the operator of the IV. category workplace in a controlled area,
b) inform an exposed worker and another individual of the current radiation situation and countermeasures taken in response to an arising situation,
c) verify whether the exposed worker and another individual entering a controlled area, when performing a radiation activity, meet occupational requirements and technical administrative requirements aimed at ensuring radiation protection and
d) communicate with an exposed worker and another individual if a consultation with them is necessary considering the current radiation situation, or manage their activities, so that the information is communicated clearly, in a comprehensible manner and without any undue delay.

Part 2
Controlled and supervised areas

Controlled area

§ 46

(To § 73(3) of the Atomic Act)

(1) The controlled area shall be delineated as part of the workplace

a) integrated and clearly defined;
b) structurally separated, if practicable; and
c) with protection against entry of any unauthorised person.

(2) The controlled area shall designated at the entrance or the delineation marked

a) by a sign about radiation danger;
b) by the notice “Controlled area with sources of ionising radiation. No admittance unauthorised to persons”,; and
c) information on the nature of the source of ionising radiation and the related risk.

(3) The controlled area shall be delineated within the scope that includes all working places where it is not possible to avoid that

a) the average ambient dose equivalent rate in the working place can be greater than 2.5 μSv/h per calendar year;
b) the sum of the products of the activity volume concentrations for individual radionuclides in the air at the workplace and the conversion factors h_{inh} for intake by inhalation by an exposed worker can be greater than 2.5 $\mu Sv/m^3$ on average per year; or
c) surface contamination in the workplace can be greater than the values of surface activity specified in Annex 18 to this implementing decree.

(4) The controlled area may be entered only by an individual who has received instruction about behaviour that does not endanger the person's’ health or the health of other individuals. For an individual who should undergo medical exposure or non-medical exposure in the controlled area, the instruction pursuant to subparagraph 1 is not required.

(5) A person younger than 18 years of age may enter the controlled area if the person is being trained there for their future work or is undergoing medical exposure or non-medical exposure.

(6) A pregnant woman may enter the controlled area if she is to undergo medical or non-medical exposure there or if she works in the controlled area.

(7) Work in the controlled area may only be performed by category A exposed workers. A different individual may perform, in the controlled area,

a) necessary and accidental activities
   1. for the necessary period and
   2. under the supervision of a category A exposed worker appointed by the controlled-area operator; or
b) in the case of a category B exposed worker, activities consisting in helping an individual undergoing medical exposure.

(8) The Office inspector may enter the controlled area on their own.

(9) Cleaning or maintenance in the controlled area may be performed

a) by a category B exposed worker or a different individual on their own in a workplace handling a radiation generator, a sealed radioactive source or equipment containing a sealed radioactive source provided that it is ensured that during their presence the equipment cannot be activated; or
b) a category B exposed worker in a level II or level III workplace handling an unsealed radioactive source provided that such a source is not handled in the workplace in their presence and if it has been confirmed by measurement that surface contamination in the workplace is lower than the values surface activity provided in Annex 18 to this implementing decree.

§ 47

(To § 73(3) of the Atomic Act)

Radiation protection in the controlled area shall be ensured in the following way:
a) the rooms, space and places in the controlled area of a workplace with a nuclear installation where the values provided in § 46(3) are exceeded on a permanent basis shall be labelled with a sign marking an extend of radiation hazard; if these values are exceeded temporarily, so these rooms, space and places shall be labelled with a sign indicating measured values of ambient dose equivalent rate and voluminal and surface activity;
b) the surface contamination of workplaces or structural parts of the controlled area shall be lower than the values of surface activity specified in Annex 18 to this implementing decree when a source of ionising radiation is not handled; if surface contamination exceeds these values, effective decontamination shall be performed;
c) the controlled-area operator shall provide individuals entering the controlled area with personal protective equipment and aids suitable in respect of the radiation situation in the controlled area and the method of work to be performed and reasons for entering the controlled area;
d) if during standard operation or in the case of foreseeable deviations from standard operation the ambient dose equivalent rate in the controlled area can exceed 1 mSv/h, the controlled-area operator shall provide each individual entering the controlled area, with the exception of individuals who are to undergo medical exposure or non-medical exposure in the controlled area, with an operational personal dosimeter with function of signalization of exceeding of a set level;
e) if in the controlled area surface contamination of a person entering cannot be eliminated, it is possible to enter after changing they e their clothes and put on the clothes specified by the internal regulation of the controlled-area operator; when leaving the controlled area a check for surface contamination of the individual shall be performed and if any surface contamination is discovered personal clean-up and decontamination shall be performed; if it is not possible to remove surface contamination, the individual can leave the controlled area under the conditions provided in the internal regulation of the controlled-area operator;
f) if it is not possible to eliminate surface contamination of objects taken from the controlled area, a check of their surface contamination shall be performed along with their decontamination in the case that surface contamination is discovered;
g) it is forbidden to smoke in the controlled area of a workplace handling an unsealed radioactive source; it is possible to eat and drink only in the case that considering the scope of the controlled area and the type of activity performed, it is not possible to leave the controlled area on a short-term basis; in such a case the controlled-area operator shall

define a special area for consumption with the possibility to check surface contamination of individuals along with measures eliminating the contamination of food; and

h) for an individual who is not an exposed worker and who is entering the controlled area, the controlled-area operator shall specify in the monitoring programme operational values to ensure that dose constraints for members of the public will not be exceeded.

§ 48

(To § 73(3) of the Atomic Act)

(1) Documentation for the licensed activity in the controlled area shall include the following

a) the scope of the controlled area by providing a list of rooms and a schematic plan;
b) justification proposed scope of the controlled area, in particular, by calculations and other evidence demonstrating the fulfilment of the requirements specified in this implementing decree and the Atomic Act;
c) a description of structural and technical safeguarding of the controlled area preventing access of an unauthorised individual;
d) a description of ensuring radiation protection in the controlled area; and
e) information on the expected number of individuals working in the controlled area and the method of their instruction as to risks related to work in the controlled area.

(2) The documentation concerning the operation of the controlled area shall include

a) instructions for entering the controlled area and conditions for entering the controlled area to be fulfilled by an exposed worker or a different individual;
b) procedures for individual activities performed in the controlled area;
c) procedures for the evaluation of the exposure of different individuals entering the controlled area; and
d) conditions for leaving the controlled area by an individual and taking objects out of the controlled area, including the method of decontamination.

§ 49

Supervised area

(To § 74(4) of the Atomic Act)

(1) The supervised area shall be delineated as part of the workplace

a) integrated and clearly defined; and
b) structurally separated, if practicable.

(2) The supervised area shall be designated at the entrance or its delineation marked

a) by a sign about radiation danger,
b) by a notice that says “Supervised area with sources of ionising radiation”, and
c) with information on the nature of the source of ionising radiation and the related risk.

(3) Radiation protection in the supervised area shall be ensured in the following way:

a) radiation activity may only be performed by a category A exposed worker;
b) for an individual who is not an exposed worker and who is entering the supervised area, the supervised-area operator shall specify in the monitoring programme operational values to ensure that dose constraints for members of the public will not be exceeded;

c) the workplace in the supervised area shall be equipped with protective equipment and aids along with shielding depending on the nature of the handled source of ionising radiation; and
d) the surface contamination of the workplaces or structural parts of the supervised area shall be lower than the values of radioactive contamination specified in Annex 18 to this implementing decree when the source of ionising radiation is not handled; if surface contamination exceeds these values, effective decontamination shall be performed.

(4) The documentation for operation of the supervised area shall include procedures for individual activities executed in the supervised area.

Part 3
Workers, documentation and evaluation of radiation protection

Informing and preparing workers

(To § 68(2)(h) and (i) of the Atomic Act)

§ 50

(1) An exposed worker and an individual who is trained in the controlled area or supervised area for their future work shall be informed by the licensee or the registrant of the following

a) the nature and scope of possible danger to their health, risks related to work in an environment containing ionising radiation and possible damage to their health;
b) the general procedures and principles of radiation protection and measures that shall be taken in relation to the respective activity;
c) specific operating and working conditions related to the workplace and work activity to which they may be assigned;
d) importance of meeting the requirement for health protection and the technical and administrative requirements aimed at ensuring radiation protection;
e) the importance of a safety culture for ensuring radiation protection; and
f) the importance of early reporting on pregnancy and breastfeeding due to the risk arising from possible exposure of the foetus and infant if a woman is concerned.

(2) The licensee or registrant shall make a record of the provision of information pursuant to subsection 1. The record shall be confirmed by the exposed worker or the individual who is trained in the controlled area or supervised area for their future work by their signature.

(3) The licensee or registrant shall provide for a system of continuous education for an exposed worker to ensure that the workers are familiar with

a) general rules and procedures for radiation protection;
b) measures concerning radiation protection when performing radiation activities during standard operation, under foreseeable deviations from such operation or upon the occurrence of a radiation incident; and
c) internal regulations and documentation for licensed activities.

(4) For an exposed worker working in the controlled area in a level IV workplace, the system of continuous education shall include an introduction to internal regulations and documentation for the controlled area.

(5) The exposed worker's' knowledge and competence to perform radiation activities in a safe manner shall be tested prior to the commencement of work and also at regular intervals,

at least once a calendar year in the form of an exam of which a record must be made. If the exposed worker fails the exam, a corrective measure shall be specified.

(6) The record of the exam pursuant to subsection 5 shall include the following

a) the scope of tested knowledge;
b) a list of names of all tested exposed workers;
c) the date of the exam;
d) criteria for the evaluation of the exam;
e) the result of the exam; and
f) a description of measures taken in case any of the exposed workers fail the exam.

(7) Testing pursuant to subsection 5 is not required

a) for an exposed worker who actively performs the role of the supervisor for the respective licensee; or
b) for an exposed worker who, for the respective registrant, actively performs the role of the person providing the registrant's radiation protection.

Programme ensuring radiation protection

§ 51

(To § 24(7) of the Atomic Act)

The programme ensuring radiation protection shall include

a) a description of the licensed activity;
b) the place of the performance of the licensed activity;
c) the specification of the types of sources of ionising radiation within the framework of the licensed activity;
d) a description of the organisational structure of the person performing the licensed activity;
e) rights, duties and mutual relationships between individuals who manage, perform or evaluate the licensed activity;
f) a description of the method of documentation and records management within the framework of the licensed activity, including a list of such documentation and records;
g) a description of the method of the submission of information to the Office;
h) a description of the method of addressing non-conformities, including the application of corrective measures and the evaluation of their effect;
i) a description of the system of informing and educating an exposed worker in the field of radiation protection and readiness to response to a radiation incident and testing their knowledge; and
j) a description of the scope of monitoring, measurement, evaluation, verification and recording quantities and facts relevant to radiation protection.

§ 52

(To § 24(7) of the Atomic Act)

The programme ensuring radiation protection shall also include for

a) the management of sources of ionising radiation in a level I or level II workplace
   1. a description of the method of ensuring of providing of occupational health services for exposed workers;

   2. a description of ensuring metrologically correct measurements and measuring devices;
   3. a description of the method of ensuring acceptance tests and tests of long-term stability;
   4. the scope and description of the method of the performance of tests of operational reliability; and
   5. the frequency of tests of operational reliability;

b) the management of sources of ionising radiation in a workplace handling unsealed radioactive sources
   1. the principles of radioactive waste management;
   2. the principles of the clearance of radioactive substances from a workplace; and
   3. the principles of using personal protective equipment and aids, their characteristics and a description of the system of their assignment;

c) the management of sources of ionising radiation in a workplace performing medical exposure;
   1. a description of the method of recording a radiological event, performing investigation of said event and taking measures to eliminate its occurrence and mitigate its consequences; and
   2. the principles of using personal protective equipment and aids, their characteristics and a description of the system of their assignment; and

d) the import, export or distribution of a source of ionising radiation
   1. specification of the documentation handed over to the users of an imported, exported or distributed source of ionising radiation, and
   2. a description of the method of ensuring the transport of a source of ionising radiation with the exception of a radiation generator.

e) the provision of services in the controlled area by the operators of a level IV workplace
   1. a list of the controlled areas in which the licensed activity is performed;
   2. a description of the method of ensuring of providing of occupational health services to exposed workers;
   3. a description of the system of monitoring and evaluation of individual doses received by exposed workers;
   4. a description of the system of management of personal radiation passports;
   5. a description of activities provided by suppliers; and
   6. the principles of using personal protective equipment and aids, their characteristics and a description of the system of their assignment;

f) the evaluation of the characteristics of a source of ionising radiation pursuant to § 9(2)(f)(8) of the Atomic Act
   1. a description of the method of ensuring of providing of occupational health services for exposed workers;
   2. the principles of using personal protective equipment and aids, their characteristics and a description of the system of their assignment;
   3. a description of the method of ensuring assistance of a person for whom the evaluation of the characteristics of a source of ionising radiation is performed;
   4. a description of the method of evaluation of the results of the test of long-term stability and the acceptance test;
   5. a description of the determination of time limits for the removal of less significant defects;
   6. a description of the procedure to be followed if a change in the scope of operational reliability tests is proposed within the framework of the test of long-term stability;

7. a description of the method of keeping materials acquired during the tests of a source of ionising radiation; and
8. a description of activities provided by suppliers;

g) the management of products of mining activity resulting from activities related to the extraction of a radioactive mineral and deposited in spoil heaps and sludge settling lagoons
1. the principles of the management of products of mining activity resulting from activities related to the extraction of a radioactive mineral;
2. principles of the clearance of products of mining activity resulting from activities related to the extraction of a radioactive mineral into the environment; and
3. the principles of using personal protective equipment and aids, their characteristics and a description of the system of their assignment; and

h) services relevant to radiation protection pursuant to § 9(2)(h)(2) and (5) through (7) of the Atomic Act
1. a description of ensuring metrologically correct measurements and measuring devices;
2. a description of the system for the education of individuals participating in the provision of this service; and
3. a degree of the physical participation of the individuals managing the provision of this service during measurements executed within the framework of the service provision.

§ 53

Other documentation

(To § 24(7) of the Atomic Act)

The content of other documentation for licensed activities within the framework of exposure situations other than the programme to ensure radiation protection is specified in Annex 19 to this implementing decree.

§ 54

Evaluation of the method of radiation protection ensuring

(To § 69(2)(a) of the Atomic Act)

(1) The evaluation of the method of ensuring radiation protection by the licensee shall include the following

a) a description of the assessment of the radiation protection optimisation based on the results of individual monitoring or workplace monitoring;
b) a list and a summary of deviations from standard operation and exceeding monitoring levels or dose constraints and measures taken;
c) an overview of the fulfilment of duties imposed on the licensee, namely
1. the provision of occupational health services for exposed workers;
2. the education of exposed workers; and
3. testing the exposed workers'' competence to perform radiation activities in a safe manner;

d) an assessment of the availability of protective equipment and aids;
e) an evaluation of the condition of the source of ionising radiation based on the results of the tests performed;

f) an assessment of the security of the source of ionising radiation;
g) an evaluation of the performed inventory inspection of sealed radioactive sources,
h) an evaluation of the balance of spent activity for unsealed radioactive sources;
i) a list and analysis of radiological events and cases when a radiological event could have occurred if the causes had not been early discovered and removed;
j) a list of revisions of local diagnostic reference levels; and
k) a description of the evaluation of executed practical exercises.

(2) The evaluation of the method of ensuring radiation protection shall be approved by the licensee or its statutory body if the licensee is a legal person.

Part 4
Workplace operation

§ 55

Conditions of safe operation for a workplace handling a radiation generator

(To § 75(5)(a) of the Atomic Act)

(1) A radiation generator can be used only for a period necessary for achieving the required purpose.

(2) A radiation generator must visibly indicate a state when it is generating the radiation.

(3) A stationary radiation generator, excluding the source of ionising radiation used for medical exposures for which the presence of the health professionals in the irradiation room is necessary because of the correct procedure, must be operated from operating room or operating place whose construction excludes exceeding the dose constrains. If more than one generator is placed in the irradiation room, they must not be used concurrently.

(4) A device or equipment containing a radiation generator and protective shielding can be used provided that

a) it is ensured that the device or equipment cannot be activated if the protective shielding is removed; and
b) the device or equipment is automatically deactivated if the protective shielding is opened.

§ 56

Conditions for the safe operation of a sealed radioactive source along with installation and workplace

(To § 75(5)(a) of the Atomic Act)

(1) A sealed radioactive source shall be used only for the period necessary for achieving the required purpose.

(2) If the sealed radioactive source is not used, it shall be deposited in a protective shield or shielded otherwise so that

a) during storage the ambient dose equivalent rate
   1. on the surface of the shield, container, shielded storage rooms, vaults and shielded boxes does not exceed a value of 100 μSv/h; and
   2. at a distance of 1 m from the surface of the shield, container, shielded storage rooms, vaults or shielded boxes the dose equivalent rate does not exceed a value of 10 μSv/h; and

b) when a sealed radioactive source is being transported around the workplace, the dose equivalent rate at a distance of 1 m from the surface of the transport shield does not exceed a value of 100 μSv/h.

(3) During a radiation exposure with a sealed radioactive source, it shall be verified by measuring or signalling after the finished work or before entering the delineated or shielded irradiation room whether the sealed source is properly shielded or inserted in a shield.

(4) For handling a sealed radioactive source whose loosening from the irradiation equipment or loss cannot be ruled out, a measuring device that is able to indicate the source's' location under all circumstances shall be used.

(5) The functionality of the accessories of mobile equipment containing a sealed radioactive source shall be verified at regular intervals, at least once a year.

(6) If a leakage of a sealed radioactive source is discovered, the shutdown of the sealed radioactive source together with its equipment shall be ensured along with their proper protection against misuse.

(7) In the case of significant leakage with more than 100 times the limit value pursuant to Annex 10(2) of this implementing decree, the environment of the sealed radioactive source together with its equipment shall be closed until a test of radioactive contamination and effective decontamination, if necessary, are performed.

§ 57

Conditions for the safe operation of a workplace handling an unsealed radioactive source

(To § 75(5)(a) of the Atomic Act)

(1) At a level I-III workplace handling an unsealed radioactive source, it is possible at individual workplaces to process at the same time the maximum activity defined based on criteria taking into account the ventilation, insulation and shielding equipment available at individual workplaces along with the drainage, physical and chemical characteristics of the substances that are to be processed, particularly the volatility and dust nuisance and the demands and risk level of the assumed work activities. The procedure for the determination of the maximum processed activity is specified in Annex 9 to this implementing decree.

(2) When the unsealed radioactive source is not used and unless a source consisting of technological units or workplace media is concerned, it shall be deposited in a protective shield or container that effectively prevents the scattering of the radioactive substance and so that

a) during storage the ambient dose equivalent rate
   1. on the surface of the shield, container, shielded storage rooms, vaults and shielded boxes does not exceed a value of 100 μSv/h; and
   2. at a distance of 1 m from the surface of the shield, container, shielded storage rooms, vaults or shielded boxes the dose equivalent rate does not exceed a value of 10 μSv/h; and
b) when an unsealed radioactive source is being transported around the workplace, the ambient dose equivalent rate at a distance of 1 m from the surface of the transport container does not exceed a value of 100 μSv/h.

(3) Requirements provided in subsection 1 shall not apply to

a) a level III workplace where activities related to the extraction of radioactive minerals are performed;
b) a workplace handling a nuclear installation; and
c) a workplace handling a nuclear waste repository that is not a nuclear installation.

Temporary workplace

§ 58

(To § 77(2) of the Atomic Act)

(1) A licensee using a source of ionising radiation in a temporary workplace shall ensure radiation protection of the public, workers and the environment of the temporary workplace

a) by directing the primary beam of ionising radiation in a manner preventing exposure of an individual;
b) by selecting the time for the performance of activities with regard to the movement of individuals in the environment of the temporary workplace;
c) by informing an individual who might be affected by the activity at the temporary workplace; and
d) by using natural barriers preventing the entry of an unauthorised person together with the delimitation of the controlled area.

(2) The perimeter of the controlled area at a temporary workplace shall be designated

a) by a warning strip;
b) by a sign about radiation danger;
c) by a notice that says "Controlled area with sources of ionising radiation. No admittance",; and
d) in the case of reduced visibility, by light signalling.

(3) The members of the working team providing activities in a temporary workplace where the controlled area is delineated shall include, at the moment of the performance of activities, at least two category A exposed workers competent to execute the respective radiation activity in a safe manner, of whom one is the supervisor or the radiation protection officer in the respective expert field of the application of the source of ionising radiation.

(4) The working team shall be equipped with a detector to monitor the workplace within the scope corresponding to the used sources of ionising radiation.

(5) If the ambient dose equivalent rate in a temporary workplace can exceed 1 mSv/h, the exposed worker shall be equipped with an operational personal dosimeter with function of signalization of exceeding of a set level.

§ 59

(To § 77(2) of the Atomic Act)

(1) The holder of the licence to handle a source of ionising radiation that is an insignificant, minor or simple source of ionising radiation, with the exception of an X-ray flaw detector and a logging unit with a sealed radioactive source, shall submit to the Office before the first use of the source of ionising radiation in a temporary workplace

a) a list of used sources of ionising radiation;
b) a description of the work activities; and

c) the expected number of interventions in the temporary workplace per calendar year.

(2) The holder of the licence to use a source of ionising radiation that is a significant source of ionising radiation, an X-ray flaw detector or a logging unit with a sealed radioactive source shall submit to the Office the following information in writing at least one day in advance

a) the date of commencement of the work activities;
b) the assumed time of work in the temporary workplace;
c) a description of the work activities;
d) a list of used sources of ionising radiation; and
e) a telephone number of the worker who will execute continuous supervision in the temporary workplace.

(3) A holder of the licence to use a source of ionising radiation that is a significant source of ionising radiation, an X-ray flaw detector or a logging unit with a sealed source of radioactive shall submit to the Office before commencement of work activities an unambiguous specification of the workplace with the source of ionising radiation, namely by providing the geographic coordinates or address of the temporary workplace, including the house number of the building on the premises or the plot number.

(4) A holder of the licence to use a source of ionising radiation shall immediately inform the Office of the completion of work in the temporary workplace.

Part 5
Changes in radiation protection

§ 60

List of changes affecting radiation protection for a level III or level IV workplace

(To § 9(2)(c) of the Atomic Act)

(1) A change affecting radiation protection of a level IV workplace refers to

a) a change in the structural design of the level IV workplace;
b) reconstruction of the source of ionising radiation or a change modifying the shielding characteristics of its accessories;
c) a change in the arrangement of the controlled area that modifies the method of its use; or
d) an organisational change in the activity management particularly relevant to radiation protection.

(2) A change affecting radiation protection for a level III or level IV workplace refers to

a) a change in the structural part or the technological system or equipment in the controlled area in the workplace resulting in a change in their shielding, insulating or protecting characteristics;
b) a change in the structural part or equipment in the workplace controlled area resulting in a change in the method for safeguarding the source of ionising radiation;
c) a change in the method for decommissioning such a workplace;
d) a change in the conditions for further use of the territories and systems, structures or components after the decommissioning of such a workplace unless a complete decommissioning is concerned; or
e) a change in the possibility of accumulation of the radioactive substance in the environment in the case of its long-term release from the workplace.

(3) A change affecting radiation protection in a level III workplace , with the exception of a workplace where medical exposure is performed, and a level IV workplace refers to a change in the method of the monitored quantity value determination, architecture of the installed monitoring systems, the concept of data processing or the physical principle of measurement for

a) a monitoring device whose output is compared to limits and conditions;
b) a monitoring device that serves
   1. for the verification of the observance of exposure limits;
   2. for the verification of the observance of the authorised limits for effluents; or
   3. for the purposes of clearance of the radioactive substance from the workplace; or
c) a stationary monitoring device that is designed for the detection of radioactive substance leaks or for the monitoring of the radiation situation during a radiation incident.

§ 61

List of changes related to radiation protection for a workplace handling a source of ionising radiation

(To § 69(2)(d) of the Atomic Act)

(1) A change related to radiation protection for a level IV workplace refers to a change in the type of monitoring device with the preserved physical principle of measurement or a change in the number of stationary monitoring devices;

a) whose outputs are compared to limits and conditions;
b) that serves
   1. for the verification of the observance of the exposure limits;
   2. for the verification of the observance of the authorised limits for effluents; or
   3. for the purposes of clearance of the radioactive substance from the workplace; or
c) that are designed for the detection of radioactive substance leaks or for the monitoring of the radiation situation during a radiation incident.

§ 62

Scope and method of the documentation of a change related to radiation protection for a workplace handling a source of ionising radiation and the method and time limits for its reporting to the Office

(To § 69(2)(e) of the Atomic Act)

(1) The documentation of a change related to radiation protection in a workplace handling a source of ionising radiation shall include the following

a) a description and reasons for the change;
b) a list of documentation for the licensed activity updated in respect of the change;
c) the assumed time schedule for implementation of the change; and
d) the assessment of the change impact on radiation protection.

(2) The Office shall be notified of a change related to radiation protection in a workplace handling a source of ionising radiation in writing 30 days prior to the change implementation.

Part 6
Registration

§ 63

Specification of the job to be performed by the registrant's person responsible for radiation protection

(To § 70(2)(b) of the Atomic Act)

The person ensuring radiation protection for the registrant shall ensure

a) that exposed workers and trainee preparing for their future work in the workplace of facts relevant to radiation protection and the potential risk of work with a source of ionising radiation;
b) continuous education for exposed workers concerning the safe use of a source of ionising radiation;
c) the proper management of documentation for the registered activity;
d) the records of the movement and condition of sources of ionising radiation;
e) the organisation of acceptance tests, long-term stability tests and operational reliability tests for sources of ionising radiation and participation in such tests;
f) the execution of procedures for safe handling of a source of ionising radiation, including procedures preventing unauthorised management of the source of ionising radiation, its loss, theft or damage, and including procedures to be followed in the case of deviations from standard operation;
g) the investigation of a radiological incident and measures taken in relation thereto; and
h) regular verification of the protective characteristics of personal protective equipment and other protective aids.

§ 64

Procedures for ensuring radiation protection by the registrant when handling a source of ionising radiation

(To § 70(2)(c) of the Atomic Act)

The procedures for ensuring radiation protection by the registrant when handling a source of ionising radiation are specified in Annex 20 to this implementing decree.

§ 65

Documentation for the registered activity

(To § 17(3) of the Atomic Act)

(1) The documentation for the registered activity refers to

a) a report of the acceptance test or the last test of long-term stability of the source of ionising radiation; and
b) a document attesting to the completion of the preparation of the registrant's person responsible for radiation protection.

(2) The specimens of the registration forms are provided in Annex 21 to this implementing decree.

Part 7
Monitoring

§ 66

Monitoring programme

(To § 24(7) of the Atomic Act)

(1) Depending on the types of monitoring that the licensee is obliged to perform, the monitoring programme shall consist of the following parts

a) monitoring of a workplace;
b) individual monitoring;
c) monitoring of effluents; and
d) monitoring of the environment.

(2) The monitoring programme shall include monitoring rules for the standard operation of the workplace, foreseeable deviations from the standard operation of the workplace, radiation incidents and radiation accidents, namely

a) the specification of monitored quantities;
b) the method, scope and frequency of measurements;
c) the method of recording and retention period for measurement results;
d) procedures for the evaluation of measurement results;
e) the values of monitoring levels and measures to be taken when such levels are exceeded;
f) the values of dose constraints;
g) a description of the measurement methods;
h) a description of the monitoring of persons intervening in the case of a radiation incident or radiation accident according to the on-site emergency plan for the workplace;
i) a specification of the part of an exposed worker's body where a personal dosimeter is placed; and
j) a specification of the types of measuring devices and aids, including parameters thereof.

(3) The content of this monitoring programme shall be drawn up in a way that allows

a) verification of observance of the exposure limits;
b) the demonstration of the optimised state of radiation protection; and
c) early detection of deviations from the standard operation of the workplace.

§ 67

Procedures for the evaluation of quantities measured within the framework of monitoring

(To § 78(3)(d) of the Atomic Act)

(1) In the case of the conversion of activities of received radionuclides into the committed effective dose, the conversion factors shall be applied. In the case of unidentified radionuclides and chemical forms or characteristics of inhaled aerosol, the activity for radionuclides, their forms or aerosol with the highest conversion factor for intake by ingestion or inhalation shall be applied. The conversion factors for the conversion according to subparagraphs 1 and 2 are specified in Annex 3 to this implementing decree.

(2) If no data better corresponding to a situation where exposure occurs are available, the quantity of inhaled air per year for the representative person is

a) up to 5 year of age, inclusive, 1 500 m^3,
b) from 6 to 15 years of age, inclusive, 6 500 m^3 and
c) above 15 years of age, 8 500 m^3.

(3) If no data better corresponding to a situation where exposure occurs are available, the quantity of ingested water per year for the representative person is

a) under 5 years of age including, 275 l;
b) from 6 to 15 years of age including, 365 l; and
c) above 15 years of age, 730 l.

(4) If no data are known that better describe a situation in which an irradiation occurs than a worker, with the exemption of the worker mentioned in paragraph 7, inhale 2 000 m^3 of air per year during a work lasting 2 000 hours.

(5) If, during the determination of external exposure, a conversion of the average activity volume concentration of rare radioactive gases dispersed in the air into the effective dose rate is executed, the conversion factors specified in Annex 3 to this implementing decree shall be applied.

(6) For the calculation of the effective dose due to inhalation of radon progeny from the air in the area affected by extraction and processing of uranium ore, the value of background radiation of radon equivalent activity volume concentration is 10 Bq/m^3, unless a different value in this area is known.

(7) For the determination of internal exposure by radon progeny and intake by inhalation of a mixture of long-lived radionuclides emitting the alpha particles of the uranium-radium series per year, an exposed worker performing extraction activity or activity executed in a mining manner underground during work lasting 2 000 hours inhales 2 400 m^3 of air.

§ 68

Monitoring levels

(To § 81(3)(b) of the Atomic Act)

(1) The monitoring levels refer to

a) a recording level;
b) an investigation level; and
c) an intervention level.

(2) The recording levels shall be specified at the level of

a) 1/10 of the exposure limits considering the duration of the monitoring period; or
b) the minimum detectable value of the measured quantity.

(3) The investigation levels shall be specified at the level of

a) 3/10 of the exposure limits considering the duration of the monitoring period; or
b) the upper limit for normally monitored values of the measured quantity.

(4) Upon reaching or exceeding the recording level, the data shall be recorded and retained.

(5) Upon exceeding the investigation level, an investigation into the causes and determining the consequences of the deviation of the radiation protection monitored quantity shall be performed.

(6) Upon exceeding the intervention limit, a predefined measure shall be implemented to

a) repair the resulting state; and
b) prevent any undesirable development of the resulting state.

§ 69

Workplace monitoring

(To § 78(3)(b) of the Atomic Act)

(1) In a level I-IV workplace, with the exception of a level I workplace where only minor sources of ionising radiation, not being unsealed sources, are used, the workplace monitoring shall be executed by the monitoring, measurement, evaluation and recording of quantities and parameters characterising the field of ionising radiation and the occurrence of radionuclides in the workplace.

(2) Depending on the type of the sources of ionising radiation used, workplace monitoring shall be executed

a) by monitoring the ambient dose equivalent rate in the workplace;
b) by monitoring the activity volume concentrations in the air in the workplace and the surface activities in the workplace; or
c) by measuring stray radiation.

(3) The efficiency of protection against external and internal exposures shall be verified by the measurements of the ambient dose equivalent rate, activity volume concentration or other quantities necessary for the verification of the efficiency of protection against external and internal exposure, namely at the source of ionising radiation, in workplaces with such a source and in places where exposed workers or other individuals may stay upon

a) the commencement of the workplace operation;
b) a change in working procedures;
c) a change in ensuring radiation protection; or
d) a change in the monitoring of the radiation situation.

(4) The monitoring of radioactive contamination shall be executed in a workplace handling an unsealed radioactive source in a manner

a) allowing
    1. deviations in operation from standard operation; and
    2. insufficient function or failure of barriers preventing scattering to be signalled; and
b) making it possible to confirm that the values for surface radioactive contamination have not been exceeded; the values for surface radioactive contamination are specified in Annex 18 to this implementing decree.

(5) The continuous monitoring of the activity volume concentrations for radionuclides in the air shall be performed in

a) a level IV workplace;
b) a workplace where an activity related to the extraction of a radioactive mineral is executed, and
c) a different workplace of the level III category handling an unsealed radioactive source where contamination of the atmosphere may occur considering the character of the used radioactive source and the method of its handling.

Individual monitoring of an exposed worker

§ 70

(To § 73(3)(a) of the Atomic Act)

(1) The individual monitoring of an exposed worker shall be executed to determine the individual doses received by an exposed worker by monitoring, measurement and evaluation of their external as well as internal exposure.

(2) The individual monitoring of external exposure by a personal dosimeter shall be ensured for the category A exposed worker. For the category A exposed worker, the period for the evaluation of the personal dosimeter shall be 1 calendar month.

(3) The personal dosimeter shall be placed in a reference point being the left front side of the chest (hereinafter referred to as the "reference point") or in a different point depending on exposure geometry. If a protective shielding apron is used, the personal dosimeter shall be placed outside such an apron.

(4) If one dosimeter does not allow a sufficiently accurate determination of the effective dose and equivalent dose in the bodies and tissues for which limits are defined, the exposed worker shall be equipped with other personal dosimeters allowing such determination due to their characteristics or positioning.

(5) The personal dosimeter shall measure all kinds of radiation which contribute to the exposed worker's external exposure. If one personal dosimeter fails to fulfil this requirement, the exposed worker shall be equipped with other personal dosimeters unless the monitoring programme defines a different method of individual monitoring for the exposed worker.

(6) The exposed worker who performs activities, which are executed and monitored using a source of ionising radiation in the exposed worker's presence in the irradiation room near the source of ionizing radiation, according to the monitoring program is equipped with a protective shielding apron should be assigned two personal dosimeters, one of them is placed on the apron and the other one under it. In the case that personal dosimeter placed on the apron is evaluated value of personal dose equivalent in a depth of 10 mm higher than 10 mSv has to be assessed also a dosimeter placed under the protective shielding apron and based on the evaluation of both dosimeters, the evaluation of the coefficient of attenuation of the used protective shielding apron shall be ensured along with the evaluation of the actual effective dose received by the exposed worker when taking into account the exposure of unprotected parts of body.

§ 71

(To § 73(3)(a), (e) and (f) of the Atomic Act)

(1) If it is not possible to eliminate the exceeding of the exposure limits for an exposed worker due to single external exposure, the exposed worker shall be equipped with operational personal dosimeters with function of direct signalization of the exceeding of the set level of the monitored quantity.

(2) If single exposure caused by a source of ionising radiation can exceed five-times the occupational limit for exposed workers, individual monitoring of an exposed worker shall allow doses and their distribution in the exposed worker's body to be determined.

(3) At workplaces with a possibility of internal exposure of an exposed worker, radionuclide intakes or committed effective doses caused by the internal exposure of individual exposed workers shall be determined by radionuclide activity measurements in the

exposed worker's body or the worker's excretes where such activities shall be converted into an intake of radionuclides or committed effective dose using the models of the respiratory and digestive tracts and the kinetics of appropriate chemical elements. If measurements of an exposed workers are not possible, intake of radionuclides and committed effective dose is determined by measuring activity concentration of radionuclides in the air at workplace and then recalculating to intake of radionuclides or committed effective dose using models of the respiratory tract, gastrointestinal tract and the kinetics of appropriate chemical elements.

(4) When working with an unsealed radioactive source, the measurement of activity for radionuclides in the exposed worker's body or excretes shall be executed pursuant to subsection 2

a) in a level IV workplace at least once a year, and
b) in category I-III workplaces based on the evaluation of the potential risk of an exposed worker's internal exposure.

(5) In the event of the suspected, unplanned, single exposure of an exposed worker, which might result in exceeding the limits for the exposed worker, the immediate evaluation of the personal dosimeter and dosimetric evaluation of such an event shall be ensured.

§ 72

(To § 73(3)(a), (e) and (f) of the Atomic Act)

(1) Individual monitoring of the category B exposed worker shall be ensured

a) by a personal dosimeter,
b) by the calculation of the individual doses for the exposed worker based on data from the monitoring of the workplace where the exposed worker performs work activities, and by the monitoring of the duration of their stay in such a workplace, or
c) by equipping one or more category B exposed workers performing the same work activity in the same workplace with a personal dosimeter and by assigning the individual dose acquired by its evaluation to the other exposed workers without a personal dosimeter working in the same workplace.

(2) The results of the evaluation of individual doses for the category B exposed worker shall be used for the demonstration

a) of the accuracy of the exposed worker's classification into the category, and
b) of the stability of exposure conditions in the workplace.

(3) The licensee shall inform the exposed worker in a comprehensible manner so that it is clear that the exposed worker has been informed of

a) the results of their individual monitoring and
b) procedures after the investigation of the causes of reaching the set investigation or intervention level.

§ 73

Effluents monitoring

(To § 81(3)(a) through (c) of the Atomic Act)

(1) The monitoring of effluents from a workplace shall be performed by the monitoring, measurement, recording and evaluation of quantities and parameters characterising the

released radioactive substances, particularly by the determination of the balance of the total discharged activity and the activity volume concentration for individual radionuclides.

(2) The monitoring of effluents shall include

a) the continuous monitoring of radionuclides that significantly contribute to the exposure of the public and that are discharged for a defined period (hereinafter referred to as “balance measurement”),
b) the non-stop monitoring of radionuclides, which allows for quick detection of a deviation from standard operation for a level IV workplace, and
c) the operational monitoring of other potential pathways of the radioactive substance’s release from the workplace in the event of a leak, which would allowing such a leak to be included in the balance of effluents.

(3) The recording level shall be determined in a manner

a) allowing requirements for the minimum detectable value of the monitored quantity to be fulfilled during the balance measurement, pursuant to the implementing decree on monitoring of radiation situation, and
b) allowing all operating states to be checked within the framework of the continuous monitoring of radionuclides.

(4) The investigation level shall be defined

a) during the balance measurement at the level of the expected value of the radionuclide effluent balance, taking into account the monitoring period duration, and
b) during the monitoring of deviations from standard operation of the workplace as the upper limit of the usually monitored values of the monitored quantity.

(5) The intervention level shall be determined in a manner allowing

a) measures to be taken at the balance measurement of effluents in order to prevent the exceedance of the authorised limits or the non-observance of the licence conditions,
b) measures to be taken simultaneously with the monitoring of deviations from standard operation of the workplace in order to correct the resulting state and prevent any undesirable developments.

§ 74

Workplace environment monitoring

(To § 81(3)(a) through (c) of the Atomic Act)

(1) The monitoring of the environment of the workplace from which radioactive substances are discharged or released by different pathways shall be executed by the monitoring, measurement, evaluation and recording of quantities and parameters characterising the field of ionising radiation and the occurrence of radionuclides in the workplace environment, particularly

a) ambient dose equivalent rate,
b) activity volume concentrations for individual radionuclides, and
c) activity weight concentrations for individual radionuclides.

(2) The recording level shall be determined in a manner that allows the requirements for the minimum detectable value of the monitored quantity, pursuant to the implementing decree on monitoring of radiation situation, to be fulfilled.

(3) The investigation level shall be determined as the upper limit of the usually monitored values of the monitored quantity.

(4) The intervention level shall be determined in accordance with the requirements for public exposure optimisation.

Part 8
Medical exposure

§ 75

Equipment of a workplace for x-ray diagnostics and radiotherapy

(To § 86(3)(a) of the Atomic Act)

(1) Workplaces intended for radiotherapy shall be equipped with, in the case of

a) brachytherapy, an imaging unit designed for the localisation of applicators as well as a planning unit and dosimetric equipment for testing the characteristics of a source of ionising radiation,
b) handling a radiotherapeutic x-ray unit, dosimetric equipment for testing the characteristics of a source of ionising radiation, or
c) handling a radioactive irradiator or particle accelerator,
   1. a treatment planning system,
   2. a simulator,
   3. dosimetric equipment for testing the characteristics of a source of ionising radiation,
   4. if radical radiotherapy is performed, a verify system,
   5. if radical radiotherapy is performed, a system for dosimetric verification of applied doses, be this an in-vivo dosimetry system or a full-valued alternative and
   6. If intensity modulated radiotherapy, a system for planar and spatial dose distribution dosimetric verification

(2) Workplaces intended for x-ray diagnostics and radiotherapy shall post, in a visible place, a notification of the necessity to inform healthcare provider employees of pregnancy prior to the execution of medical exposure.

(3) The equipment of a workplace intended for x-ray diagnostics and radiotherapy shall take into account the special needs and character of this medical exposure in the event of

a) medical exposure of children,
b) health screening, or
c) exposure with a high dose is performed on a patient undergoing radiotherapy, interventional radiology and computed tomography.

Workplaces intended for radiotherapy shall be equipped with the tools for constancy tests.

Requirements imposed on sources of ionising radiation used for medical exposure

§ 76

(To § 86(3)(a) of the Atomic Act)

A source of ionising radiation used for medical exposure

d) designed for radiodiagnostics or for planning, management and verification purposes in radiotherapy, shall be equipped with a device or corresponding means providing quantitative information on the patient's exposure; if technically feasible, such information shall be automatically transferred to a record on the patient's examination,
e) for interventional radiology
   1. after the examination, it shall provide quantitative information on the patient's exposure,
   2. it shall indicate the total product of kerma and area along with cumulative reference kerma in the air, if it is for fluorography/fluoroscopy or fluoroscopy purposes
   3. it shall be equipped with aids for the execution of operational reliability tests at monthly or shorter intervals,
   4. it shall generate structured reports on radiation doses which are automatically transferred to the record on the patient's examination, and
   5. during the course of the examination, it shall inform the person performing the examination of the cumulated patient’s radiation dose, and
f) for computed tomography
   1. after examination, it shall provide quantitative information on the patient's exposure,
   2. are acquired, it shall be equipped with examination protocols that are adapted to the examination of children, if children are imaged,
   3. it shall be equipped with aids for the execution of operational reliability tests at monthly or shorter intervals,
   4. it shall provide information on the product of kerma and duration,
   5. it shall provide information on the weighted kerma index for computed tomography, or the volume kerma index for computed tomography,
   6. it shall generate structured reports on radiation doses which are automatically transferred to the record on the patient's examination, and
   7. it shall be equipped with an automatic exposure control system.

§ 77

(To § 86(3)(a) of the Atomic Act)

(1) Sources of ionising radiation used for medical exposure

a) for fluorography purposes
   1. shall not allow abreography,
   2. stationary with a digital image receptor, with the exception of a device designed exclusively for scanning the extremities, shall be equipped with an automatic exposure control system,
   3. shall be equipped with aids for the execution of operational reliability tests at monthly or shorter intervals, and
   4. stationary, with the exception of a device designed exclusively for scanning the extremities, shall be equipped with an automatic exposure control system and organ pre-settings and
   5. shall indicate the information about the kerma-area product,
b) for fluoroscopy purposes
   1. shall not allow imaging by direct fluoroscopy,
   2. shall be equipped for automatic dose rate regulation,
   3. shall automatically set the magnitude of the x-ray beam according to the size of the receptor image and the distance of the focus from the image receptor,

4. shall be equipped with an audible alarm that sounds once the total fluoroscopy duration exceeds 5 minutes,
5. shall be equipped with a function that allows the last image on the monitor to be preserved upon exposure completion,
6. with a circular image receptor, shall not have a rectangular primary diaphragm,
7. it shall be equipped with aids for the execution of operational reliability tests at monthly or shorter intervals, and
8. shall indicate the information about the kerma-area product,

c) for mammography purposes
1. shall be equipped with an automatic exposure control system,
2. with a film image receptor or with indirect digitisation, shall be equipped with an anti-diffusing screen,
3. shall provide information on compression force and thickness after compression,
4. shall be equipped with an automatic filter exchange function, depending on thickness after compression,
5. shall be equipped with an image receptor with the minimal dimensions of 18 cm × 24 cm, unless it is intended for stereotaxis, and
6. shall be equipped with aids for the execution of operational reliability tests at monthly or shorter intervals, and

d) dental intraoral
1. shall have a nominal voltage of at least 60 kV,
2. shall have a distance of the focus from the end of the tube at least 20 cm,
3. shall be equipped with aids for the execution of all operational liability tests,
4. shall be equipped with beam collimation corresponding to the image receptor in terms of shape and size,
5. shall be equipped with a corresponding holder for the image receptor, and
6. shall not be portable.

(2) Sources of ionising radiation used for medical exposure - dental panoramic x-ray units, dental computed tomography or bone densitometers, shall be equipped with aids for the execution of all operational reliability tests.

§ 78

Therapeutic and diagnostic application of a radionuclide

(To § 86(3)(b) of the Atomic Act)

(1) Upon the therapeutic and diagnostic application of a radionuclide, the activity of an unsealed radioactive source applied to the patient shall be measured, namely before its administration.

(2) The therapeutic application of a radionuclide shall be executed in the residential part of the healthcare provider's medical facility, specifically adapted and equipped for this purpose. This condition does not apply if the exposure of persons living in a household with patients after curative application of unsealed radionuclide sources do not exceed the dose constraint specified in § 64 para. 1 point. a) Atomic Act.Upon such therapeutic application of a radionuclide, it shall be ensured that the patient is not wearing their own clothes.

(3) Upon releasing the patient after the application of a radionuclide according to subsection 2 all items of personal use shall be checked for possible contamination by the

radionuclide, and if such contamination is detected, the affected items must be decontaminated or disposed of as radioactive waste.

(4) If the patient undergoes therapeutic application of a radionuclide, the licensee shall provide the patient or their legal representative, prior to the patient's leaving the healthcare facility,

a) with written information on the risks related to ionising radiation, and
b) with written instructions on how to reduce doses received by an individual who comes into contact with the patient to the minimum, reasonably attainable level.

(5) If the patient undergoes diagnostic application of a radionuclide, the licensee shall provide the patient, prior to the patient's leaving the healthcare facility, with the written instructions set out in subsection 4(b), in the event that the exposure of an individual who comes into contact with the patient could approach the values of the general limits for the public.

(6) Workplaces earmarked for the therapeutic or diagnostic application of a radionuclide shall post, in a visible place, a notification of the necessity to inform the healthcare provider's employees of pregnancy or breastfeeding prior to the execution of medical exposure.

(7) The equipment of a workplace where therapeutic or diagnostic application of a radionuclide is executed shall comply with the special needs and character of such medical exposure.

§ 79

Diagnostic reference levels

(To § 84(6) of the Atomic Act)

(1) The national diagnostic reference levels are specified in Annex 22 to this implementing decree.

(2) Records on the results of the investigation of a systematic deviation from the local diagnostic reference level shall include

a) the period during which such a deviation occurred,
b) the approximate number of patients affected by such deviation,
c) the scope of such deviation,
d) reasons for such deviation,
e) the course and results of optimisation, where optimisation was executed based on the investigation, and
f) a record on the revision of the local diagnostic reference levels, where such revision was performed based on the investigation.

(3) The record on the result of the investigation of significant exceedance of the local diagnostic reference level shall include

a) the date and time when such significant exceedance occurred,
b) the identification details of the patient affected by such exceedance, and
c) information on whether such exceedance is a radiological event.

§ 80

Incorrect exposure of a patient

(To § 60(4)(a) of the Atomic Act)

(1) The incorrect exposure of a patient, for the purposes of the definition of a radiological event, refers to

a) exposure which may endanger the patient's life upon medical exposure due to tissue reactions,
b) exposure resulting from
   1. an unintentional event during medical exposure, including human error or instrument failure, or
   2. different events during medical exposure whose consequences cannot be ignored in terms of radiation protection,
c) in radiotherapy
   1. exposure in the event of patient mix-up,
   2. the therapeutic exposure of a different tissue or organ than was planned,
   3. the application of the total dose or a dose per fraction which considerably differs from the indicated dose,
   4. the application of an incorrectly prescribed dose, or
   5. exposure, the result of which means that radiobiological effect of the treatment does not correspond to the originally planned effect caused by the interruption or by the early termination of the planned treatment that isn't caused by the health of the patient ,
d) in nuclear medicine
   1. the application of a different radiopharmaceutical product than was planned,
   2. the application of an activity considerably different from the prescribed activity,
   3. exposure in the event of patient mix-up, or
   4. the application of an incorrectly prescribed activity or radiopharmaceutical product,
e) in radiodiagnostics
   1. exposure that is several times greater than necessary,
   2. exposure in the event of patient mix-up,
   3. the exposure of a different organ or tissue than was planned, or
   4. in the case of surgery on a pregnant woman, the exposure of the embryo or foetus by a direct beam which was not indicated, and
f) in interventional radiology
   1. exposure that is several times greater than necessary,
   2. exposure in the event of patient mix-up,
   3. the exposure of a different organ or tissue than was planned,
   4. in the case of surgery on a pregnant woman, the exposure of the embryo or foetus by a direct beam which was not indicated, or
   5. cases where tissue reaction occurs due to the incorrect execution of surgery.

(2) The application of an activity that is considerably different from the prescribed activity in nuclear medicine, for the purposes of the definition of incorrect exposure, refers to

a) in the case of the therapeutic application of a radionuclide, the application of an activity which differs from the prescribed activity by more than 20 %, or
b) in the case of the diagnostic application of a radionuclide, the application of an activity which differs from the prescribed activity by more than 40 %.

§ 81

Radiological events

(To § 87(5) of the Atomic Act)

(1) Radiological events shall be classified with respect to their seriousness into categories A, B and C. The criteria for radiological event classification are specified in Annex 23 to this implementing decree.

(2) Category A or B radiological events refer to serious radiological events.

(3) Annex 23 to this implementing decree provides

a) procedures to be followed in the event of a radiological event or in the event a radiological event could have arisen had the causes not been detected and eliminated in good time,
b) content and a retention period for records from the investigation of a radiological event or in the event a radiological event could have arisen had the causes not been detected and eliminated in good time and
c) the scope and the time limit for the provision of information about a serious radiological event.

§ 82

Definition of the distribution of doses received by the public due to medical exposure

(To § 85(4) of the Atomic Act)

(1) The scope of healthcare services during which ionising radiation was used and which were reported by the healthcare provider and paid by the health insurance company, provided to the Office by the health insurance company, is specified in Annex 24 to this implementing decree.

(2) The information defined in subsection 1 shall be submitted to the Office in a machine-readable electronic format.

Part 9
Non-medical exposure

§ 83

Records on non-medical exposure to medical radiological equipment

(To § 83(7) of the Atomic Act)

Records on non-medical exposure to medical radiological equipment shall include

a) the identification of the individual who undergoes non-medical exposure,
b) reasons for each non-medical exposure,
c) the date and time of execution of each non-medical exposure,
d) a record on the exposure parameters on the basis of which it is possible to estimate the dose from non-medical exposure,
e) the identification of the source of ionising radiation with which non-medical exposure was performed,
f) the comparison of the dose from non-medical exposure with the local diagnostic reference level used for examination within the framework of medical exposure with a similar procedure and source of ionising radiation, and
g) information on the execution of non-medical exposure without the consent of the individual subject to exposure, where this procedure is in compliance with a different legal regulation.

§ 84

Records on non-medical exposure to a different source of ionising radiation

(To § 83(7) of the Atomic Act)

Records on non-medical exposure to a different source of ionising radiation shall include

a) the identification of the individual who undergoes non-medical exposure,
b) the age and gender of the individual who undergoes non-medical exposure,
c) reasons for each non-medical exposure,
d) information on the circumstances wherein an individual who was to undergo non-medical exposure refused it,
e) the date and time of execution of each non-medical exposure,
f) a record on the exposure parameters on the basis of which it is possible to estimate the dose from non-medical exposure,
g) the identification of the source of ionising radiation with which non-medical exposure was performed,
h) the comparison of the dose from non-medical exposure with the dose constraint, and
i) information on the execution of non-medical exposure without the consent of the individual subject to exposure, where this procedure is in compliance with a different legal regulation.

Part 10

Radiation protection for activity related to radioactive mineral extraction

§ 85

Workplace handling activity related to radioactive mineral extraction

(To § 88(6) of the Atomic Act)

(1) When performing an activity related to the extraction of a radioactive mineral, radiation protection shall be ensured by the delineation of

a) a supervised area at
   1. sludge settling lagoons,
   2. decontamination stations,
   3. mine water treatment plants, and
   4. industrial water treatment plants from workplaces that are part of the technological system for the radioactive minerals treatment process, and
b) a controlled area
   1. in underground workplaces where radioactive minerals are extracted,
   2. on above-ground technological units related to original mining activity during which radioactive minerals are extracted,
   3. in drying plants for uranium concentrate,
   4. in storage locations for uranium concentrate, and
   5. in the technologically integrated part of uranium ore chemical treatment plants.

(2) When delineating a supervised area and controlled area, pursuant to subsection 1, and ensuring radiation protection therein, the procedures provided in section 46 through 51 shall be followed accordingly.

§ 86

Special requirements for ensuring radiation protection during activity related to radioactive mineral extraction

(To § 88(6) of the Atomic Act)

The inspection of surface contamination of individual when leaving a controlled area of a workplace where activities related to the extraction of radioactive minerals are performed pursuant to section 47(e) is not to be executed.

Part 11
Natural sources of ionising radiation

§ 87

Workplaces handling material with increased natural radionuclide content

(To § 93(4)(a) of the Atomic Act)

Workplaces handling material with increased natural radionuclide content refers to workplaces where the following is executed

a) extraction, transport by pipelines or processing of crude oil and gas,
b) coal extraction,
c) ore extraction,
d) processing of niobium or tantalum ore,
e) processing of raw materials containing rare earth elements,
f) primary iron output,
g) smelting of tin, lead or copper,
h) production of cement, including maintenance of clinker furnaces,
i) production of phosphate fertilisers, production of phosphoric acid or thermal production of phosphorus,
j) production of a titanium-dioxide-based pigment,
k) processing of zircon or zirconium,
l) production, processing or use of materials containing thorium and uranium,
m) combustion of coal in an installation with thermal output exceeding 5 MW, including the maintenance of boilers,
n) generation of geothermal energy,
o) operation of a treatment plant to treat underground water or sludge resulting from a source of underground water,
p) treatment of material in which it was discovered that its natural radionuclide content exceeds the clearance level or increases the spatial dose equivalent rate by more than 0.5 μSv/h,
q) mining activity,
r) mining activity performed underground, or
s) activity relating to mining waste treatment.

§ 88

Definition of individual doses for workers in workplaces that may be subject to increased exposure due to a natural source of radiation

(To § 93(4)(b) of the Atomic Act)

(1) The method of measurement to define individual doses

a) for workers handling material with an increased natural radionuclide content in workplaces handling material with an increased natural radionuclide content shall include
   1. the measurement of the spatial dose equivalent rate,
   2. the measurement of the average volume activity concentrations for radionuclides in the air,
   3. the measurement of surface contamination in the workplace, and
   4. keeping records on time spent in the workplace, or
b) for workers who are members of the crew on board a plane, in the case of flights at altitudes exceeding 8 km, shall include the definition
   1. of the degree of participation in individual flights,
   2. flight characteristics, and
   3. parameters for the calculation of the effective dose, repeatedly for each calendar year.

(2) In workplaces handling material with an increased natural radionuclide content, it is necessary to perform measurements in order to assess whether the levels of

a) 300 Bq/m^3 for the radon average activity volume concentration in the air during work performance and
b) 1 mSv per year for the effective dose, which does not include doses received from exposure to natural background radiation or from exposure to radon and its progeny, have been exceeded.

(3) In workplaces handling material with an increased natural radionuclide content, where the level defined under subsection 2 has been exceeded, individual doses for workers shall be defined on the basis of repeated measurement and duration of stay in the workplace. In the case of work in several workplaces with the possibility of increased exposure to a natural source of radiation, individual doses of workers shall be aggregated. The defined individual doses of workers shall be evaluated based on the values provided in subsection 4(b).

(4) The definition of individual doses for workers does not have to be performed in the workplace handling material with an increased natural radionuclide content, on the condition that no change in the working conditions, production procedures or raw materials occurred, and

a) no exceedance of the levels defined in to subsection 2 was detected, or
b) upon the repeated measurement, pursuant to subsection 3, no possibility of exceeding
   1. 6 mSv per year for the effective dose or
   2. one third of the limits defined per calendar year in § 4(1)(b) through (d) was discovered.

(5) In workplaces where values of individual doses for workers, pursuant to subsection 4(b), may be exceeded, individual doses for workers shall be determined repeatedly in each calendar year.

§ 89

Information on workplaces that may be subject to increased exposure to a natural source of radiation and submission of such information to the Office

(To § 93(4)(b) and (c) of the Atomic Act)

(1) Data acquired by measurement, pursuant to § 88(2), and data on defined individual doses shall be kept on file for the entire period of a worker's work activity until the exposed worker reaches or would have reached 75 years of age; however, no less than 30 years after the termination of the work activity.

(2) The data defined in subsection 1 and information on exceedance of the values defined in § 88(2) and subsection 4(b) shall be submitted to the Office within one month of its acquisition.

(3) The following information on a workplace that may be subject to increased exposure to a natural source of radiation must be submitted to the Office:

a) the identification details of the person performing the activity during which the workplace is operated,
b) the name and address of the workplace,
c) data on the workplace classification under § 93(1) of the Atomic Act and § 87,
d) data on the raw material used in the workplace and a description of the technology used in the workplace,
e) a description of the workplace as well as the organisation, method and regime of work and the duration of the worker’s stay in the workplace,
f) the method of radioactive substance clearance from the workplace that may be subject to increased exposure to a natural source of radiation,
g) information on whether the released radioactive substance is used for the production of building material, and
h) a description of the optimisation of radiation protection in the workplace, a description of measures taken to ensure radiation protection and a description of the requirements under § 94(2) of the Atomic Act in the workplace.

(4) The information pursuant to subsection 3 shall be submitted to the Office for the first time prior to the commencement of the workplace operation and also upon any change thereto.

(5) The information defined in subsection 3 shall be kept on file for at least 30 years after the termination of the operation of the workplace that may be subject to increased exposure to a natural source of radiation.

§ 90

Optimisation of radiation protection in workplaces that may be subject to increased exposure to a natural source of radiation

(To § 66(6)(c) and § 93(4)(d) of the Atomic Act)

(1) The optimisation of radiation protection in a workplace that may be subject to increased exposure to a natural source of radiation shall be executed upon the exceedance of the level defined in § 88(2).

(2) The measures taken to execute the radiation protection optimisation, pursuant to subsection 1, include in particular

a) a change in
    1. raw materials used,
    2. technology, or
    3. the organisation, method or regime of work, and
b) modification of the workplace that may be subject to increased exposure to a natural source of radiation, including modification of the ventilation system.

§ 91

Clearance of a radioactive substance from workplaces that may be subject to increased exposure to a natural source of radiation

(To § 95(6)(a) through (c) of the Atomic Act)

(1) The measurement and evaluation of the content of radionuclides in a radioactive substance released from a workplace that may be subject to increased exposure to a natural source of radiation shall be executed, in the case of a workplace handling material with an increased natural radionuclide content, particularly for

a) deposits,
b) sludge,
c) used filters,
d) waste and waste water discharged outside the workplace, and
e) materials from this workplace intended for re-use or recycling.

(2) The measurement and evaluation pursuant to subsection 1 shall be performed for the first time upon the commencement of the workplace's operation and then upon any change which could affect the radionuclide content of radioactive substances, at least once every 12 months.

(3) The internal regulation for the management of a radioactive substance released from a workplace that may be subject to increased exposure to a natural source of radiation shall include

a) a list of radioactive substances handled in the workplace, including data on their radionuclide content,
b) a description of the management of radioactive substances handled by the workplace, including the method of their disposal or clearance from the workplace,
c) instructions for the safe management of radioactive substances handled in the workplace, and
d) procedures for keeping records on the quantity of radioactive substances.

(4) The reports containing results of measurement and evaluation, pursuant to subsection 1, shall be submitted to the Office within 1 month of their acquisition, either directly or through the licensee, pursuant to § 9(2)(h)(7) of the Atomic Act.

(5) The reports containing the results of measurement and evaluation, pursuant to subsection 1, shall be kept on file for 5 years after the termination of the operation of the workplace that may be subject increased exposure to a natural source of radiation.

Title III
Existing exposure situations

§ 92

Workplace that may be subject to increased exposure to radon

(To § 96(3)(a) of the Atomic Act)

The conditions for the classification of a workplace located on an underground or first above-ground floor of a building as a workplace that may be subject to increased exposure to radon are specified in Annex 25 to this implementing decree.

§ 93

Effective dose for a worker in a workplace that may be subject to increased exposure to radon

(To § 96(3)(b) of the Atomic Act)

(1) In a workplace that may be subject to increased exposure to radon, measurement to assess whether the reference level of 300 Bq/m^3 for the radon average activity volume concentration has been exceeded at the time of the worker's stay in the workplace lasting 2 000 hours over 12 months shall be executed. In the case of a different duration of the worker's stay in the workplace, the integral over-time of the radon activity volume concentration corresponding to the duration of stay shall be used.

(2) In a workplace that may be subject to increased exposure to radon where exceedance of the reference level under subsection 1 has been discovered, it shall be assessed based on repeated measurements and determination of the effective dose whether for any worker the effective dose value of 6 mSv over 12 months can be exceeded. If work is performed in several workplaces that may be subject to increased exposure to radon, the individual doses of a worker shall be aggregated.

(3) In a workplace that may be subject to increased exposure to radon, where no exceedance of the reference level under to subsection 1 was detected, or where during repeated measurements, pursuant to subsection 2, no possibility of exceeding the effective dose value of 6 mSv over 12 months was discovered, the measurement and determination of the effective dose does not have to be performed, unless

a) there has been a change in
    1. working conditions,
    2. the organisation or regime of work, or
b) the arrangement of the workplace, including a change in the ventilation system.

(4) In a workplace that may be subject to increased exposure to radon, where a possibility of exceeding the effective dose value for a worker of 6 mSv over 12 months has been discovered based on repeated measurements, pursuant to subsection 2, the measurement and determination of the effective dose shall be performed every calendar year.

§ 94

Information on a workplace that may be subject to increased exposure to radon and submission of such information to the Office

(To § 96(3)(c) and (d) of the Atomic Act)

(1) The data acquired by measurement, pursuant to § 93(1), and data on defined individual doses for workers in a workplace that may be subject to increased exposure to radon, shall be kept on file in relation the period of the worker's work activity, until the worker reaches or would have reached 75 years of age; however no less than 30 years after the termination of the work activity.

(2) The data under to subsection 1 and information on exceedance of the values defined in § 93(1) and (2) shall be submitted to the Office within one month of its acquisition.

(3) The following information on the workplace that may be subject to increased exposure to radon shall be submitted to the Office:

a) the identification details of the person performing the activity during which the workplace is operated,
b) the name and address of the workplace,
c) the type of workplace, pursuant to § 96(1) of the Atomic Act,
d) a description of the workplace as well as the organisation, method and regime of work, ventilation conditions and the duration of the worker's stay in the workplace,
e) a description of the optimisation of radiation protection in the workplace, and
f) where the condition pursuant to § 97(1) of the Atomic Act is fulfilled, a description of measures taken to ensure radiation protection and a description of the requirements under § 97(2) of the Atomic Act in the workplace.

(4) The information defined in subsection 3 shall be submitted to the Office for the first time prior to the commencement of the operation of the workplace that may be subject to an increased exposure to radon as well as upon any change in such information.

(5) The information defined in subsection 3 shall be kept on file for 30 years after the termination of the operation of the workplace that may be subject to increased exposure to radon.

§ 95

Optimisation of radiation protection in a workplace that may be subject to increased exposure to radon

(To § 66(6)(c) of the Atomic Act)

(1) The optimisation of radiation protection in a workplace that may be subject to increased exposure to radon shall be executed upon exceedance of the reference level defined in § 93(1).

(2) The measures taken to execute the radiation protection optimisation, pursuant to subsection 1, include in particular

a) a change in the organisation, method or regime of work, and
b) modification of the workplace that may be subject to increased exposure to radon, including modification of the ventilation system.

§ 96

Radon-related index of a site

(To § 98(4) of the Atomic Act)

(1) To determine the radon-related index of a site

a) a representative set of ^{222}Rn concentration measurements in soil air shall be used,
b) gas permeability in subsoil shall be assessed, and
c) the local and general geological characteristics affecting the direction and speed of radon movement in subsoil soils shall be applied.

(2) The determination of the radon-related index of a site shall be evaluated based on a combined evaluation of

a) the statistical characteristics of radon concentration in soil air and
b) gas permeability ascertained by measurement or assessment based on professional experience and knowledge.

(3) The method of the evaluation of results for the determination of the radon-related index of a site is specified in Annex 26 to this implementing decree.

(4) The radon-related index of a site is low if

a) the detected radon concentration in soil air is lower than
   1. 10 kBq/m^3 for high permeable subsoil,
   2. 20 kBq/m^3 for medium permeable building foundations soil, or
   3. 30 kBq/m^3 for low permeable subsoil, or
b) the numerical value of the radon-related index of a site determined by measurement is lower than 10.

(5) The radon-related index of a site is medium if

a) the detected radon concentration in soil air is
   1. higher than 10 kBq/m^3 and lower than 30 kBq/m^3 for high permeable subsoil,
   2. higher than 20 kBq/m^3 and lower than 70 kBq/m^3 for medium permeable subsoil, or
   3. higher than 30 kBq/m^3 and lower than 100 kBq/m^3 for low permeable subsoil, or
b) the numerical value of the radon-related index of a site determined by measurement is higher than 10 and lower than 35.

(6) The radon-related index of a site is high if

a) the detected radon concentration in soil air is higher than
   1. 30 kBq/m^3 for high permeable subsoil,
   2. 70 kBq/m^3 for medium permeable subsoil, or
   3. 100 kBq/m^3 for low permeable subsoil, or
b) the numerical value of the radon-related index of a site determined by measurement is higher than 35.

§ 97

Protection of individuals against exposure in buildings

(To § 66(6)(a) and (b) and § 99(5) of the Atomic Act)

(1) The reference level for natural exposure inside a building with living or accommodation rooms is

a) 300 Bq/m^3 for indoor radon concentration in the living or accommodation rooms; this value applies to the average value related to ventilation that is customary during use, or
b) 1 µSv/h for the maximum spatial dose equivalent rate in living or accommodation rooms at a height of 1 m above the floor and at a distance of 0.5 m from the walls.

(2) The value of the annual average radon concentration in the air, upon the exceedance of which the owners of buildings with living or accommodation rooms are obliged to take measures reducing the level of exposure, is 3 000 Bq/m^3.

(3) When the reference level pursuant to subsection 1 is exceeded, building owners shall assess the effectiveness of measures, including, in particular

a) the rearrangement of manner in which the building is used, including modification of the ventilation system, or
b) implementing structural or technological remedial measures.

(4) When following the procedure defined in subsection 3, building owners shall

a) reasonably apply the procedures for radiation protection optimisation, pursuant to § 66(1)(2)(c) and (5) of the Atomic Act, and
b) use information on the source of radon and its relevance in given situation and on the available types of measures to reduce the radon concentration the building, including the cost of them.

Protection against natural radionuclides in water

§ 98

(To § 100(3)(a) through (c) of the Atomic Act)

(1) The maximum permissible value of radon activity volume concentration in drinking water for public need and for supplying bottled water to the market is specified in Annex 27 to this implementing decree.

(2) The reference levels of the content of natural radionuclides in drinking water for public need and for supplying bottled water to the market is specified in Annex 27 to this implementing decree.

(3) The method and scope of systematic measurement and evaluation of the content of natural radionuclides in water is specified in Annex 27 to this implementing decree.

(4) The systematic measurement and evaluation of the content of natural radionuclides in water shall be executed in water from an underground source and in a mixture of water from an underground source and surface water

a) for the first time before the commencement of the supply of drinking water for public need,
b) for the first time before the commencement of the supply of bottled water on the market in the Czech Republic, and
c) at regular intervals during the supply of drinking water for public need or bottled water on the market in the Czech Republic.

(5) The frequency of systematic measurement and evaluation of the content of natural radionuclides in water is specified in Annex 27 to this implementing decree.

(6) Within the framework of systematic measurement and evaluation of the content of natural radionuclides in water, the determination of an indicative dose shall be executed if the investigation level of the total alpha activity volume concentration or the total beta activity volume concentration is exceeded. The investigation levels are specified in Annex 27 to this implementing decree.

(7) The determination of the indicative dose, pursuant to subsection 6, shall be executed based on the results of an additional analysis. The procedure for such additional analysis is specified in Annex 27 to this implementing decree.

§ 99

(To § 100(3)(a) through (c) of the Atomic Act)

(1) If the investigation level of the total alpha activity volume concentration is not exceeded and the exceedance of the investigation level of the total beta activity volume concentration is caused only by the presence of ^{40}K, the indicative dose, pursuant to § 98(6), does not have to be determined and its reference level is regarded as not exceeded.

(2) The systematic measurement of the content of natural radionuclides in water can be executed within the scope of the basic analysis if it has been

a) discovered that the reference level of the indicative dose is not exceeded, or
b) if it has been proven that upon exceeding the reference level pursuant to paragraph a), radiation protection is optimised.

(3) The scope of the basic analysis, pursuant to subsection 2, is specified in Annex 27 to this implementing decree.

(4) If the results over 5 consecutive years do not exceed the reference levels defined in § 98(2), the systematic measurement and evaluation of the content of natural radionuclides in water shall be further executed only in the case of a change that could affect the content of natural radionuclides in water, with the exception of water treatment to reduce the content of natural radionuclides.

(5) Adherence to the values pursuant to § 98(1), (2) and (6) shall be assessed

a) for water supplied from the water supply system, at the point where water leaves the tap,
b) for water supply from a water tank, at the point where water leaves the water tank,
c) for water transferred into a bottle or container intended for sale, at the point where water is transferred into the bottle or container, and
d) for water used for the preparation of food in a food-processing plant, at the point where water is used in such plant.

(6) Samples of water shall be taken for the systematic measurement and evaluation of the content of natural radionuclides in water in a manner that is representative in terms of

a) water supplied throughout an entire calendar year and for the whole region supplied with water, and
b) all produced water transferred into bottles or containers.

§ 100

Data related to protection against natural radionuclides in water and the submission of such data to the Office

(To § 100(3)(d) of the Atomic Act)

(1) Records on results of the measurement of the content of natural radionuclides in water and other data shall include, in the case of the supply of drinking water for public need, the following

a) the name or, where applicable, the names, surname, date of birth and residential address, identification number, if assigned, of the individual who is the water supplier,
b) The trade name, registered office or address of the seat of the organisational entity in the territory of the Czech Republic, if established, identification number, if assigned, of the legal entity who is the water supplier,
c) the name of the water supply system,
d) the identification details of the water source,
e) data on the water source yield and annual volume of water supplied,
f) a list of supplied municipalities and the number of members of the public supplied,
g) data on water treatment,
h) data on measures pursuant to § 100(2)(c) and (d) of the Atomic Act,
i) data on the place, date and method of sample collection,
j) reports containing the results of sample measurement, and

k) the registration number of the licensee who carries out the measurement.

(2) Records on the results of the measurement of the content of natural radionuclides in water and other data shall include, in the case of bottled water supplied on the market in the Czech Republic, the following

a) identification details, within the scope defined in subsection 1(a) and (b),
   1. of the bottled water producer, and
   2. the bottled water importer,
b) the marking and type of bottled water,
c) the identification details of the water source,
d) the annual production volume or import capacity for bottled water,
e) data on water treatment,
f) data on measures pursuant to § 100(2)(c) and (d) of the Atomic Act,
g) data on the place, date and method of sample collection,
h) reports containing the results of sample measurement, and
i) the registration number of the licensee who carries out the measurement.

(3) The data defined in subsections 1 and 2 shall be retained for a period of 5 years from the termination of the supply of drinking water for public need or placing bottled water on the market in the Czech Republic.

(4) The data, pursuant to subsection 1 and 2, shall be submitted to the Office

a) for the first time prior to the commencement of drinking water supply for public need or bottled water supply on the market in the Czech Republic, and
b) every calendar year.

(5) The data, pursuant to subsection 1(i) and (j), and subsection 2(g) and (h), may be submitted to the Office via the licensee, pursuant to § 9(2)(h)(6) of the Atomic Act.

(6) The data on the termination of drinking water supply for public need or bottled water supply on the market in the Czech Republic shall be submitted to the Office immediately.

§ 101

Optimisation of radiation protection for the supply of drinking water for public need or bottled water supply on the market in the Czech Republic

(To § 66(6)(c) of the Atomic Act)

When taking measures pursuant to § 100(2)(c) and (d) of the Atomic Act, the supplier of water and the importer of bottled water shall take into account the effectiveness of such measures. These measures refer, in particular, to:
a) the selection of a different source of water,
b) in the case of bottled water import, the import of similar bottled water with a lower natural radionuclide content, or
c) the installation of equipment reducing the natural radionuclide content.

§ 102

Protection against natural radionuclides in building materials

(To § 9(2)(j) and s. 101(4)(a) through (c) of the Atomic Act)

(1) The list of building materials pursuant to § 9(2)(j) of the Atomic Act is specified in Annex 28 to this implementing decree.

(2) The reference level for building material is 1 mSv per year for the effective dose received by the representative person from external exposure to gamma radiation when using a building with living or accommodation rooms, excluding doses received from exposure due to natural background radiation.

(3) The activity weight concentration index I is a dimensionless quantity given by the formula

$$I = a_K/3\,000\ Bq.kg^{-1} + a_{Ra}/300\ Bq\ kg^{-1} + a_{Th}/200\ Bq\ kg^{-1}$$

based on activity weight concentrations expressed in $Bq.kg^{-1}$ for the radionuclides ^{40}K, ^{226}Ra and ^{228}Th.

(4) The value of the activity weight concentration index for building materials is 1. Upon exceeding this value, the reference level pursuant to subsection 2 is regarded as exceeded.

(5) The systematic measurement and evaluation of the natural radionuclide content in building materials shall be executed by the determination of the activity weight concentration index

a) for the first time prior to placing the building material on the market, and
b) at least once per calendar year.

(6) The effective dose for the representative person due to the use of building material from external exposure to gamma radiation shall be determined based on the results of the measurement of the activity concentrations of ^{40}K, ^{226}Ra a ^{228}Th determined according to subsection 5 and evaluated by comparison with the reference level defined in subsection 2.

(7) If the building material or part thereof refers to a radioactive substance with an impaired balance of long-lived natural radionuclides released from a workplace containing material with an increased natural radionuclide content, the determination of the activity weight concentration index shall be replaced by the measurement defined in to § 95(1)(b) of the Atomic Act. The results of this measurement shall be evaluated by comparison with the reference level defined in to subsection 2. The effective dose of the representative person due to use of the building material from external exposure to gamma radiation shall be determined from the results of this measurement and evaluated by comparison with the reference level defined in subsection 2.

§ 103

Data related to protection against natural radionuclides in building material and the submission of such data to the Office

(To § 101(4)(d) of the Atomic Act)

(1) Records on the results of the measurement of the natural radionuclide content in building materials and other data shall include

a) the name or, where applicable, names, surname, date of birth and residential address of the place of residence, identification number, if assigned, of the individual who is the producer or importer of the building material,
b) trade name, registered office or address of the seat of the organisational entity in the territory of the Czech Republic, if established, identification number, if assigned, of the legal entity who is the producer or importer of the building material,
c) designation or type of the building material and raw materials for its production and data on its origin,

d) data on the annual volume of production or import of the building material,
e) data on the origin of the imported building material,
f) data characterising the scope and method of use of the building material in structures,
g) data on the place, date and method of sample collection,
h) reports containing the results of sample measurement, and
i) the registration number of the licensee who carries out the measurement.

(2) The data, pursuant to subsection 1, shall be retained for at least 5 years from the termination of the building material supply on the market in the Czech Republic.

(3) The data, pursuant to subsection 1, shall be submitted to the Office

a) for the first time before the building material is placed on the market in the Czech Republic, and
b) every calendar year.

(4) The data, pursuant to subsection 1(g) and (h), can be submitted to the Office via the licensee, pursuant to § 9(2)(h)(6) of the Atomic Act.

(5) Information on the termination of the building material supply on the market in the Czech Republic shall be submitted to the Office without any undue delay.

Title IV
Clearance

§ 104

Clearance levels for a workplace handling sources of ionising radiation

(To § 76(6) of the Atomic Act)

(1) The clearance levels for a workplace handling sources of ionising radiation are regarded as exceeded,

a) in the case of the clearance of an object or solid substance, if
   1. in the object or the quantity of solid substance subject to clearance, the sum of the quotients of the average activity weight concentrations for individual radionuclides and their clearance levels of the activity weight concentration is greater than 1; the clearance levels of the activity weight concentration are specified in Annex 7 to this implementing decree, or
   2. wherever, over an area of 300 cm^2 on the surface of the object subject to clearance, surface contamination is greater than the surface activity clearance levels; the clearance levels for surface activity are specified in Annex 7 to this implementing decree,
b) when discharging waste waters into surface waters, if the sum of the products of the average activity volume concentrations for individual released radionuclides and their maximum conversion factors h_{ing} for intake by ingestion for an adult member of the public is greater than 0.1 mSv/m^3; the maximum conversion factor h_{ing} for intake by ingestion for an adult member of the public is specified in Annex 3 to this implementing decree,
c) when discharging waste water into the waste water disposal system for public need, if the sum of the products of the average activity volume concentrations for individual radionuclides subject to clearance and their conversion factors h_{ing} for intake by ingestion for an adult member of the public is greater than 10 mSv/m^3,

d) when releasing radionuclides into the atmosphere, if the sum of the products of the average activity volume concentrations for individual released radionuclides and their maximum conversion factors h_{inh} for intake by inhalation for an adult member of the public, according to the Annex 3 to this implementing decree, is greater than 0.1 $\mu Sv/m^3$; the conversion factor h_{inh} for intake by inhalation for an adult member of the public is specified in Annex 3 to this implementing decree,
e) when depositing on a waste dump, if
   1. in the object or solid substance subject to clearance the sum of the quotients of the average activity weight concentrations for individual radionuclides and their clearance levels of activity weight concentration is greater than 1, or
   2. the ambient dose equivalent rate at a distance of 1 m from the surface of a waste dump at the point of deposition at the waste dump is greater than 0.4 μSv/h, and
f) when incinerated in an incineration plant, if
   1. the combustion gases released into the atmosphere exceed the clearance levels pursuant to paragraph d), or
   2. the ash that arises from combustion exceeds the clearance levels pursuant to paragraphs a) or e).

(2) The average activity weight concentration pursuant to, subsection 1(a) and (e), applies to every object subject to clearance or quantity of homogeneous solid substance subject to clearance. The quantity of solid substance subject to clearance is regarded as homogeneous if the density of the solid substance in no part of its volume differs from its average density by more than 30 %, and the activity weight concentration of the solid substance in no part of the volume differs from its activity weight concentration by more than 30 %.

(3) The average activity volume concentration of the quantity of the liquid or gaseous substance subject to clearance, pursuant to subsection 1(b) through (d), shall be determined from a representative sample of the substance extracted before its release or extracted during release.

§ 105

Clearance levels for a workplace that may be subject to increased exposure to a natural source of radiation

(To § 95(6)(d) of the Atomic Act)

(1) The clearance levels for the clearance of solid materials from a workplace that may be subject to increased exposure to a natural source of radiation, including their disposal on waste dumps, clearance for re-use, recycling or combustion, are

a) the activity weight concentration of natural radionuclides from the series ^{238}U 1 kBq/kg,
b) the activity weight concentration of natural radionuclides from the series ^{232}Th 1 kBq/kg, or
c) the activity weight concentration of ^{40}K 10 kBq/kg.

(2) The clearance levels, pursuant to subsection 1, are not regarded as exceeded if the average activity weight concentration of none of the radionuclides is greater than the value of the clearance level.

(3) The clearance levels for discharge of waste water into surface water are

a) the average total alpha activity volume concentration in all substances 0.5 Bq/l and
b) the average total beta activity volume concentration after the deduction of the contribution of ^{40}K in all substances 1 Bq/l.

(4) The clearance levels, pursuant to subsection 3, are not regarded as exceeded if the average alpha activity volume concentration or the average beta activity volume concentration after the deduction of the contribution of ^{40}K is not greater than the value of the clearance level.

(5) The clearance levels for discharge of waste water into the waste water disposal system for public need are

a) the average total alpha activity volume concentration in all substances 50 Bq/l, and
b) the average total beta activity volume concentration after the deduction of the contribution of ^{40}K in all substances 100 Bq/l.

(6) The clearance levels pursuant to subsection 5 are not regarded as exceeded if the average alpha activity volume concentration or the average beta activity volume concentration after the deduction of the contribution of ^{40}K is not greater than the value of the clearance level.

(7) The average values, pursuant to subsections 1, 3 and 5, apply to the quantity of materials subject to clearance in which it is possible to regard the activity weight concentration or the activity volume concentration as homogeneous.

Title V
Emergency exposure situations

§ 106

Reference levels for emergency exposure situations

(To § 66(6)(a) of the Atomic Act)

The reference level for the exposure of an individual in an emergency exposure situation is 100 mSv for the sum of the effective dose from external exposure and the committed effective dose from internal exposure.

§ 107

Protective measures for an emergency exposure situation

(To § 104(9)(a) of the Atomic Act)

(1) When substantiating and optimising within the framework of decision-making on the implementation of protective measures in an emergency exposure situation, the following shall be taken into account

a) circumstances affecting the feasibility of the protective measures, particularly
   1. population density,
   2. traffic situation,
   3. existence of large settlement units,
   4. time necessary for the preparation of the evacuation of residents, or
   5. the current meteorological situation,
b) the magnitude of exposure of individuals which would be averted due to the implementation of the protective measure, and
c) the consequences of the implemented protective measures.

(2) Urgent protective measures shall be always implemented if doses absorbed in organs could exceed, over less than 2 days in any individual, the levels specified in Annex 29 to this implementing decree.

(3) A justified urgent protective measure refers to

a) sheltering, if the averted effective dose is greater than 10 mSv over the period of sheltering lasting no longer than 2 days,
b) stable iodine administration, if
   1. internal contamination by radioactive iodine is imminent, and
   2. the averted committed equivalent dose in the thyroid gland caused by iodine radioisotopes is greater than 100 mSv, or
c) evacuation, if the sum of the effective dose so far received in an emergency exposure situation when taking into account the effect of the already implemented protective measures and the effective dose, which could be averted, is greater than 100 mSv over the first 7 days.

(4) A justified urgent recovery countermeasure refers to

a) the limitation of the use of food, water and fodder contaminated by radionuclides, if the averted annual committed effective dose is greater than 1 mSv, and
b) the relocation of members of the public, if it is not possible to ensure an effective dose for the members of the public, after their return to the affected territory, of lower than 20 mSv over the following 12 months.

(5) When deciding on the cancellation of the implemented protective measures, exposure which would occur after the cancellation of the protective measures shall be taken into account.

(6) The cancellation of protective measure including sheltering, evacuation and relocation of members of the public is regarded as justified if the effective dose over the following 12 months after the cancellation of protective measure were lower than 20 mSv.

(7) In the case of a concurrent emergency exposure situation and a radiological emergency after a separate incident, any possible aggravation of damage sustained due to such a radiological emergency as a result of the implementation of a protective measure within a scope larger than the benefit from the reduction of exposure shall be taken into account.

Informing an emergency responder of the risk related to the intervention and data on intervention

§ 108

(To § 104(9)(b) and (c) of the Atomic Act)

(1) An emergency responder whose assignment to the intervention is assumed beforehand shall receive, within the framework of their regular education, general and regularly updated information on

a) the effects of ionising radiation and the related potential health risks, and
b) the precautions of radiation protection to avert or mitigate exposure.

(2) The person responsible for appointing the emergency responder shall inform the emergency person before the intervention about

a) the current radiation situation and about evaluation of the effective dose that emergency worker can obtain during an intervention, and
b) all protective measures which must be adhered to in the course of the intervention.

(3) An emergency person whose assignment to the intervention is not assumed beforehand shall receive the information pursuant to subsections 1 and 2 within a reasonable scope. The emergency responder shall confirm in writing that they have received such information.

(4) Person sending an emergency worker to an intervention shall, after completing the intervention, inform the emergency worker about assessed effective dose which the emergency worker received during the intervention.

(5) Emergency responders who are members of the Fire Rescue Service of the Czech republic, the Police of the Czech Republic or the Army of the Czech Republic shall be informed, prior to taking or swearing an oath of service, that within the framework of their service they can be assigned to an intervention where the reference level of 100 mSv may be exceeded.

§ 109

(To § 104(9)(b) through (e) of the Atomic Act)

(1) The consent of the emergency person with their participation in the intervention shall be recorded in writing along with the emergency responder's signature. The consent of the emergency responder who is a member of the team of the Fire Rescue Service of the Czech republic, of the Police of the Czech Republic or the Army of the Czech Republic is regarded as given upon taking or swearing an oath of service.

(2) Personal protective equipment and aids for emergency responders shall as much as possible lower surface and internal contamination of such persons.

(3) The list of emergency responders and the records and data on facts pursuant to § 108 and subsection 1 shall be retained by the delegating person for a period of 10 years as of the completion of the intervention.

(4) Records on monitoring and the evaluation of the magnitude of exposure received by the emergency responder shall be retained by the delegating person for a period of 30 years as of the completion of the intervention.

(5) Identification details of the emergency responder and the dose received by them shall be submitted by the delegating person to the Office immediately upon the completion of the intervention.

§ 110

Procedures for the optimisation of measures to manage lasting exposure resulting from an emergency exposure situation

(To § 66(6)(a) and (c) of the Atomic Act)

(1) When optimising measures to be taken to manage lasting exposure resulting from an emergency exposure situation, the following shall be taken into account in the existing exposure situation

a) external exposure due to environmental contamination, and
b) internal exposure due to the intake of contaminated food or contaminated water.

(2) Reference level for management of lasting exposure resulting from an emergency exposure situation is 20 mSv in 12 month as a maximum.

(3) Measure for lasting exposure management at administration of a contaminated area resulted from an emergency exposure situation shall comprise

a) delineation of the contaminated areas by their contamination extent,
b) restriction of individual's movement,
c) determination of conditions for crop and livestock production,
d) determination of conditions for consumption in a contaminated area,
e) conditions for decontamination in a contaminated area and
f) conditions for storage and treatment of contaminated waste.

(4) Unless more accurate information on the duration of stay in buildings and in the field is known, it shall be understood that the representative person spends 7 000 hours per calendar year inside buildings.

(5) When optimising measures to be taken to manage lasting exposure resulting from the radioactive contamination of the food chain, the following shall be taken into account

a) the level of contamination of items of the food chain, and
b) the representation of the contaminated items of the food chain among the food purchases of the representative person.

PART THREE

SECURITY OF RADIOACTIVE SOURCES

§ 111

Procedures for the security of radioactive sources

(To § 164(2) of the Atomic Act)

(1) The licensee shall provide for level 1-3 security of a radioactive source by

a) specifying information relevant to the security of a radioactive source and by providing for the protection of such information against misuse, and
b) by taking measures to detect and restrict unauthorised access to radioactive sources and respond thereto, particularly
   1. by preventing unauthorised relocation, where a radioactive source from security level 1 is concerned, and
   2. by reducing the likelihood of unauthorised relocation to the minimum attainable level, where a radioactive source from security level 2 or 3 is concerned.

(2) Securing a radioactive source from security categories 1 to 3 shall involve

a) a system for the detection of unauthorised access to a radioactive source from security categories 1 to 3, which shall provide for
   1. the detection of unauthorised relocation of a radioactive source from security level 3,
   2. the detection of any attempted unauthorised access to a radioactive source from security levels 1 and 2,
   3. the detection of any attempted unauthorised access to a radioactive source from security level 1 by an unauthorised employee of the licensee, and

4. obtaining information necessary for the immediate evaluation of the detected unauthorised access,

b) a system of barriers to restrict relocation of a radioactive source, which shall provide for
   1. a reduction in the likelihood of unauthorised relocation of a radioactive source from security level 3,
   2. a reduction in the likelihood of unauthorised relocation of a radioactive source from security level 2 to the minimum attainable level, and
   3. sufficient restriction to be able to start an intervention and prevent unauthorised relocation of a radioactive source from security level 1, and

c) a system of response to unauthorised access, which shall include
   1. taking measures in the event of unauthorised relocation of a radioactive source from security level 3,
   2. taking measures to prevent unauthorised relocation of a radioactive source from security level 2 in due time or its interruption, and
   3. immediate intervention to prevent unauthorised relocation of a radioactive source and ensure sufficient human as well as material resources for such an intervention for a radioactive source from security level 1.

§ 112

Elements of the security system

(To § 164(2) of the Atomic Act)

The elements which the security system for a radioactive source shall include are

a) technical means and organisational measures obviously making access to a radioactive source more difficult and therefore discouraging an unauthorised individual from misconduct,
b) technical means and organisational measures providing for the early detection of unauthorised access to a radioactive source,
c) mechanical and other barriers extending as much as possible the time necessary for unauthorised relocation of a radioactive source,
d) organisational measures ensuring a response to unauthorised access to a radioactive source, and
e) rules for work with individuals, information and technical means aimed at securing a radioactive source.

§ 113

Security plan

(To § 24(7) of the Atomic Act)

The security plan shall include

a) a description of the radioactive source, its categorisation and a description of the method of its use,
b) a description of the place of use and deposition of the radioactive source, its environment and its location in buildings and on premises,
c) the location of the buildings and premises in respect of places open to the public,
d) the objectives of the security plan for the buildings and premises, taking into account the following
   1. special conditions and hazards, and

   2. procedures to prevent undesirable consequences of unlawful acts,

e) a description of measures taken to secure the radioactive source, including
   1. control of access to the radioactive source,
   2. the detection of unauthorised access to the radioactive source,
   3. the restriction of unauthorised access to the radioactive source,
   4. intervention in the event of unauthorised access to the radioactive source,
   5. methods of communication between the persons who evaluate outputs from the security system and the persons performing the intervention, and
   6. the assessment of the effectiveness of the measures pursuant to paragraphs 1-5,

f) a description of administrative measures taken to secure the radioactive source, including
   1. the rights and duties of workers,
   2. standard and extraordinary operations with the radioactive source, maintenance and repairs of the technical means restricting access to the radioactive source and providing for the early detection of unauthorised access to the radioactive source,
   3. the method of ensuring the protection of information relevant to the radioactive source security,
   4. the methods of controlling access to the radioactive source, and
   5. personnel training methods, and

g) a description of measures to be taken if the threat becomes aggravated.

§ 114

Protection of information relevant to radioactive source security

(To § 164(2) of the Atomic Act)

(1) The information relevant to radioactive source security refers to

a) data on radioactive sources and their location,
b) the planned modes of transport and their route,
c) data included in the security plan,
d) data on the security system,
e) data on safeguarding,
f) data on administrative measures within the framework of the radioactive source security, and
g) data on the intervention preventing unauthorised relocation of a radioactive source from security level 1.

(2) The information, pursuant to subsection 1, may be provided by the licensee only to those persons who need to be aware of said information in order to be able to carry out the activity entrusted to them, and only within the scope necessary for such performance.

(3) The licensee shall appoint an individual responsible for providing for the safeguarding of the radioactive source and the coordination of activities within the framework of the radioactive source security.

(4) The licensee shall ensure that the individual participating in the safeguarding of the radioactive source and the individual independently accessing the radioactive source from security level 1 are selected and continuously assessed with respect to the security risk that such a person may represent.

PART FOUR

FINAL PROVISIONS

§ 115

Notification

This implementing decree was notified in accordance with Directive (EU) 2015/1535 of the European Parliament and of the Council of 9 September 2015 laying down a procedure for the provision of information in the field of technical regulations and of rules on Information Society services.

§ 116

Transitional provision

(1) The long-term stability test performed, pursuant to § 27(1)(a)(6), after the entry into force of this implementing decree, on a simple source of ionising radiation

a) a dental intraoral x-ray device on which the previous long-term stability test was performed in 2015, shall be performed within 24 months of this long-term stability test,
b) a dental panoramic x-ray device, manufactured before 2005 on which the previous long-term stability test was performed in 2016, shall be performed within 24 months of the previous long-term stability test,
c) a dental panoramic x-ray device, manufactured before 2009, shall be performed within 12 months of the previous long-term stability test,
d) a dental panoramic x-ray device, manufactured between 2009 and 2011, shall be performed within 24 months of the previous long-term stability test, or
e) a veterinary x-ray device manufactured before 2006, shall be performed within 24 months of the previous long-term stability test.

(2) The requirements imposed on sources of ionising radiation used for medical exposure provided for in

a) § 76(a), (b)(3) and (4) and (c)(3),(4) and (6) shall be applied to those sources of ionising radiation installed after the entry into force of this implementing decree, and
b) § 76(b)(5) and (c)(7) shall be applied to those sources of ionising radiation installed after 1 February 2018.

(3) The requirements imposed on sources of ionising radiation used for medical exposure provided for in

a) § 77(1)(a)(3), (b)(7), (c)(6), (d)(3) through (6) and (2) shall be applied to those sources of ionising radiation installed after the entry into force of this implementing decree, and
b) § 77(1)(a)(4) shall be applied to those sources of ionising radiation installed after 1 February 2018 and
c) § 77(1)(a)(5) and (b)(8) shall be applied to those sources of ionising radiation installed after 1 April 2012.

(4) An emergency worker, who is a member of the Fire Rescue Service of the Czech Republic, the Police of the Czech Republic, or the Army of the Czech Republic before the effective day of this decree is considered to be informed one in the meaning of the § 108 (4) from the effective day of this decree.

(5) A consent of an emergency worker by (4) in the meaning of the § 109 (1) is considered to be granted by making a promise or taking an oath before the effective day of this decree.

§ 117

Entry into force

This implementing decree shall enter into force on 1 January 2017, with the exception of

a) § 75(4), § 76(b)(2) and (c)(2) and § 77(1)(b)(4) and (6) and (d)(1) and (2), which shall enter into force on 1 February 2018, and

b) § 77(1)(a)(2), which shall enter into force on 1 January 2021.

Chairwoman:

Ing. Drábová, Ph.D., v. r.

Annex 1 to Implementing Decree No. 422/2016 Coll.

D-values for selected radionuclides and their multiples

Radionuclide	D-value [TBq]
H-3	2.10^{3}
Be-7	1.10^{0}
Be-10	3.10^{1}
C-11	6.10^{-2}
C-14	$5. 10^{1}$
N-13	6.10^{-2}
F-18	$6. 10^{-2}$
Na-22	$3. 10^{-2}$
Na-24	$2. 10^{-2}$
Mg-28	$2. 10^{-2}$
Al-26	$3. 10^{-2}$
Si-31	$1. 10^{1}$
Si-32*	$7. 10^{0}$
P-32	$1. 10^{1}$
P-33	2.10^{2}
S-35	$6. 10^{1}$
Cl-36	$2. 10^{1}$
Cl-38	$5. 10^{-2}$
Ar-37	UL
Ar-39	3.10^{2}
Ar-41	$5. 10^{-2}$
K-40	UL
K-42	2.10^{-1}
K-43	$7. 10^{-2}$
Ca-41	UL
Ca-45	1.10^{2}
Ca-47*	$6. 10^{-2}$
Sc-44	$3. 10^{-2}$
Sc-46	$3. 10^{-2}$
Sc-47	7.10^{-1}
Sc-48	$2. 10^{-2}$
Ti-44*	$3. 10^{-2}$
V-48	$2. 10^{-2}$

Radionuclide	D-value [TBq]
V-49	2.10^{3}
Cr-51	$2. 10^{0}$
Mn-52	$2. 10^{-2}$
Mn-53	UL
Mn-54	$8. 10^{-2}$
Mn-56	$4. 10^{-2}$
Fe-52*	$2. 10^{-2}$
Fe-55	8.10^{2}
Fe-59	$6. 10^{-2}$
Fe-60*	$6. 10^{-2}$
Co-55*	$3. 10^{-2}$
Co-56	$2. 10^{-2}$
Co-57	7.10^{-1}
Co-58	$7. 10^{-2}$
Co-58m*	$7. 10^{-2}$
Co-60	$3. 10^{-2}$
Ni-59	1.10^{3}
Ni-63	$6. 10^{1}$
Ni-65	1.10^{-1}
Cu-64	3.10^{-1}
Cu-67	7.10^{-1}
Zn-65	1.10^{-1}
Zn-69	$3. 10^{1}$
Zn-69m*	2.10^{-1}
Ga-67	5.10^{-1}
Ga-68	$7. 10^{-2}$
Ga-72	$3. 10^{-2}$
Ge-68*	$7. 10^{-2}$
Ge-71	1.10^{3}
Ge-77*	$6. 10^{-2}$
As-72	4.10^{-2}
As-73	$4. 10^{1}$
As-74	$9. 10^{-2}$

Radionuclide	D-value [TBq]
As-76	2.10^{-1}
As-77	$8. 10^{0}$
Se-75	2.10^{-1}
Se-79	2.10^{2}
Br-76	$3. 10^{-2}$
Br-77	2.10^{-1}
Br-82	$3. 10^{-2}$
Kr-81	3.10^{1}
Kr-85	$3. 10^{1}$
Kr-85m	5.10^{-1}
Kr-87	$9. 10^{-2}$
Rb-81	1.10^{-1}
Rb-83	1.10^{-1}
Rb-84	$7. 10^{-2}$
Rb-86	7.10^{-1}
Rb-87	UL
Sr-82	$6. 10^{-2}$
Sr-85	1.10^{-1}
Sr-85m*	1.10^{-1}
Sr-87m	2.10^{-1}
Sr-89	$2. 10^{1}$
Sr-90*	$1. 10^{0}$
Sr-91*	$6. 10^{-2}$
Sr-92*	$4. 10^{-2}$
Y-87*	$9. 10^{-2}$
Y-88	$3. 10^{-2}$
Y-90	$5. 10^{0}$
Y-91	$8. 10^{0}$
Y-91m*	1.10^{-1}
Y-92	2.10^{-1}
Y-93	6.10^{-1}
Zr-88*	$2. 10^{-2}$
Zr-93*	UL

Radionuclide	D-value [TBq]
Zr-95*	4. 10^{-2}
Zr-97*	4. 10^{-2}
Nb-93m	3.10^{2}
Nb-94	4. 10^{-2}
Nb-95	9. 10^{-2}
Nb-97	1.10^{-1}
Mo-93*	3.10^{2}
Mo-99*	3.10^{-1}
Tc-95m	1.10^{-1}
Tc-96	3. 10^{-2}
Tc-96m*	3. 10^{-2}
Tc-97	UL
Tc-97m	4.10^{1}
Tc-98	5. 10^{-2}
Tc-99	3. 10^{1}
Tc-99m	7.10^{-1}
Ru-97	3.10^{-1}
Ru-103*	1.10^{-1}
Ru-105*	8.10^{-2}
Ru-106*	3.10^{-1}
Rh-99	1.10^{-1}
Rh-101	3.10^{-1}
Rh-102	3.10^{-2}
Rh-102m	1.10^{-1}
Rh-103m	9.10^{2}
Rh-105	9.10^{-1}
Pd-103*	9. 10^{1}
Pd-107	UL
Pd-109	2. 10^{1}
Ag-105	1.10^{-1}
Ag-108m	4.10^{-2}
Ag-110m	2.10^{-2}
Ag-111	2. 10^{0}
Cd-109	2. 10^{1}
Cd-113m	4. 10^{1}
Cd-115*	2.10^{-1}
Cd-115m	3. 10^{0}
In-111	2.10^{-1}
In-113m	3.10^{-1}
In-114m	8.10^{-1}
In-115m	4.10^{-1}
Sn-113*	3.10^{-1}
Sn-117m	5.10^{-1}
Sn-119m	7. 10^{1}
Sn-121m*	7. 10^{1}
Sn-123	7. 10^{0}
Sn-125	1.10^{-1}
Sn-126*	3.10^{-2}
Sb-122	1.10^{-1}
Sb-124	4.10^{-2}
Sb-125*	2.10^{-1}
Sb-126	2.10^{-2}
Te-121	1.10^{-1}
Te-121m*	1.10^{-1}
Te-123m	6.10^{-1}
Te-125m	1. 10^{1}
Te-127	1. 10^{1}
Te-127m*	3. 10^{0}
Te-129	1. 10^{0}
Te-129m*	1. 10^{0}
Te-131m*	4.10^{-2}
Te-132*	3.10^{-2}
I-123	5.10^{-1}
I-124	6.10^{-2}
I-125	2.10^{-1}
I-126	1.10^{-1}
I-129	UL
I-131	2.10^{-1}
I-132	3.10^{-2}
I-133	1.10^{-1}
I-134	3.10^{-2}
I-135	4.10^{-2}
Xe-122	6.10^{-2}
Xe-123*	9.10^{-2}
Xe-127	3.10^{-1}
Xe-131m	1. 10^{1}
Xe-133	3. 10^{0}
Xe-135	3.10^{-1}
Cs-129	3.10^{-1}
Cs-131	2. 10^{1}
Cs-132	1.10^{-1}
Cs-134	4.10^{-2}
Cs-134m*	4.10^{-2}
Cs-135	UL
Cs-136	3.10^{-2}
Cs-137*	1.10^{-1}
Ba-131*	2.10^{-1}
Ba-133	2.10^{-1}
Ba-133m	3.10^{-1}
Ba-140*	3.10^{-2}
La-137	2. 10^{1}
La-140	3.10^{-2}
Ce-139	6.10^{-1}
Ce-141	1. 10^{0}
Ce-143*	3.10^{-1}
Ce-144*	9.10^{-1}
Pr-142	1. 10^{0}
Pr-143	3. 10^{1}
Nd-147*	6.10^{-1}
Nd-149*	2.10^{-1}
Pm-143	2.10^{-1}
Pm-144	4.10^{-2}
Pm-145	1. 10^{1}
Pm-147	4. 10^{1}
Pm-148m	3.10^{-2}
Pm-149	6. 10^{0}
Pm-151	2.10^{-1}
Sm-145*	4. 10^{0}
Sm-147	UL
Sm-151	5.10^{2}
Sm-153	2. 10^{0}

Radionuclide	D-value [TBq]
Eu-147	2.10^{-1}
Eu-148	3.10^{-2}
Eu-149	$2.\ 10^{0}$
Eu-150b	$2.\ 10^{0}$
Eu-150a	5.10^{-2}
Eu-152	6.10^{-2}
Eu-152m	2.10^{-1}
Eu-154	6.10^{-2}
Eu-155	$2.\ 10^{0}$
Eu-156	5.10^{-2}
Gd-146*	3.10^{-2}
Gd-148	4.10^{-1}
Gd-153	$1.\ 10^{0}$
Gd-159	$2.\ 10^{0}$
Tb-157	1.10^{2}
Tb-158	9.10^{-2}
Tb-160	6.10^{-2}
Dy-159	$6.\ 10^{0}$
Dy-165	$3.\ 10^{0}$
Dy-166*	$1.\ 10^{0}$
Ho-166	$2.\ 10^{0}$
Ho-166m	4.10^{-2}
Er-169	2.10^{2}
Er-171	2.10^{-1}
Tm-167	6.10^{-1}
Tm-170	$2.\ 10^{1}$
Tm-171	3.10^{2}
Yb-169	3.10^{-1}
Yb-175	$2.\ 10^{0}$
Lu-172	4.10^{-2}
Lu-173	9.10^{-1}
Lu-174	8.10^{-1}
Lu-174m*	6.10^{-1}
Lu-177	$2.\ 10^{0}$
Hf-172*	4.10^{-2}
Hf-175	2.10^{-1}
Hf-181	1.10^{-1}

Radionuclide	D-value [TBq]
Hf-182*	5.10^{-2}
Ta-178a	7.10^{-2}
Ta-179	$6.\ 10^{0}$
Ta-182	6.10^{-2}
W-178	9.10^{-1}
W-181	5.10^{0}
W-185	1.10^{2}
W-187	1.10^{-1}
W-188*	$1.\ 10^{0}$
Re-184	8.10^{-2}
Re-184m*	7.10^{-2}
Re-186	$4.\ 10^{0}$
Re-187	UL
Re-188	$1.\ 10^{0}$
Re-189	$1.\ 10^{0}$
Os-185	1.10^{-1}
Os-191	$2.\ 10^{0}$
Os-191m*	$1.\ 10^{0}$
Os-193	$1.\ 10^{0}$
Os-194*	7.10^{-1}
Ir-189	$1.\ 10^{0}$
Ir-190	5.10^{-2}
Ir-192	8.10^{-2}
Ir-194	7.10^{-1}
Pt-188*	4.10^{-2}
Pt-191	3.10^{-1}
Pt-193	3.10^{3}
Pt-193m	$1.\ 10^{1}$
Pt-195m	$2.\ 10^{0}$
Pt-197	$4.\ 10^{0}$
Pt-197m*	9.10^{-1}
Au-193	6.10^{-1}
Au-194	7.10^{-2}
Au-195	$2.\ 10^{0}$
Au-198	2.10^{-1}
Au-199	9.10^{-1}
Hg-194*	7.10^{-2}

Radionuclide	D-value [TBq]
Hg-195m*	2.10^{-1}
Hg-197	$2.\ 10^{0}$
Hg-197m*	7.10^{-1}
Hg-203	3.10^{-1}
Tl-200	5.10^{-2}
Tl-201	$1.\ 10^{0}$
Tl-202	2.10^{-1}
Tl-204	$2.\ 10^{1}$
Pb-201*	9.10^{-2}
Pb-202*	2.10^{-1}
Pb-203	2.10^{-1}
Pb-205	UL
Pb-210*	3.10^{-1}
Pb-212*	5.10^{-2}
Bi-205	4.10^{-2}
Bi-206	2.10^{-2}
Bi-207	5.10^{-2}
Bi-210*	$8.\ 10^{0}$
Bi-210m	3.10^{-1}
Bi-212*	5.10^{-2}
Po-210	6.10^{-2}
At-211	5.10^{-1}
Rn-222	4.10^{-2}
Ra-223*	1.10^{-1}
Ra-224*	5.10^{-2}
Ra-225*	1.10^{-1}
Ra-226*	4.10^{-2}
Ra-228*	3.10^{-2}
Ac-225	9.10^{-2}
Ac-227*	4.10^{-2}
Ac-228	3.10^{-2}
Th-227*	8.10^{-2}
Th-228*	4.10^{-2}
Th-229*	1.10^{-2}
Th-230*	7.10^{-2}
Th-231	$1.\ 10^{1}$
Th-232*	UL

Radionuclide	D-value [TBq]
Th-234*	$2.\ 10^{0}$
Pa-230*	1.10^{-1}
Pa-231*	6.10^{-2}
Pa-233	4.10^{-1}
U-230*	4.10^{-2}
U-232*	6.10^{-2}
U-233	7.10^{-2}
U-234*	1.10^{-1}
U-235*	8.10^{-5}
U-236	2.10^{-1}
U-238*	UL
$U_{Natural}$	UL
$U_{Depleted}$	UL
$U_{Enriched\ 10\text{-}20\%}$	8.10^{-4}
$U_{Enriched\ 20\%\ a\ více}$	8.10^{-5}
Np-235	1.10^{2}
Np-236b*	7.10^{-3}
Np-236a	8.10^{-1}
Np-237*	7.10^{-2}
Np-239	5.10^{-1}
Pu-236	1.10^{-1}
Pu-237	$2.\ 10^{0}$
Pu-238	6.10^{-2}
Pu-239	6.10^{-2}
Pu-240	6.10^{-2}
Pu-241*	$3.\ 10^{0}$
Pu-242	7.10^{-2}
Pu-244*	3.10^{-4}
Am-241	6.10^{-2}
Am-242m*	3.10^{-1}
Am-243*	2.10^{-1}
Am-244	9.10^{-2}
Cm-240	3.10^{-1}
Cm-241*	1.10^{-1}
Cm-242	4.10^{-2}
Cm-243	2.10^{-1}

Radionuclide	D-value [TBq]
Cm-244	5.10^{-2}
Cm-245	9.10^{-2}
Cm-246	2.10^{-1}
Cm-247	1.10^{-3}
Cm-248	5.10^{-3}
Bk-247	8.10^{-2}
Bk-249	$1.\ 10^{1}$
Cf-248*	1.10^{-1}
Cf-249	1.10^{-1}
Cf-250	1.10^{-1}
Cf-251	1.10^{-1}
Cf-252	2.10^{-2}
Cf-253	4.10^{-1}
Cf-254	3.10^{-4}
239Pu/9Be([1])	6.10^{-2}
241Am/9Be([1])	6.10^{-2}

Legend:

'UL' - unlimited amount
'*' - the daughter radionuclide contributes significantly to the total dose within the scope of the scenario under consideration
([1]) - activity is the activity of the radionuclide emitting alpha radiation
'a' - short half-life
'b' - long half-life

Annex 2 to Decree No. 422/2016 Coll.

Radiation weighting factors, tissue weighting factors, quality factors

Radiation weighting factors

Type of radiation		Radiation weighting factor w_R
photons		1
electrons and muons		1
protons and charged pions		2
alpha particles, fission fragments, heavy ions		20
neutrons: the following continuous neutron energy functions:	$E_n < 1$ Mev	$2,5 + 18,2e^{-\frac{\ln^2 E_n}{6}}$
	$1 \text{ MeV} \leq E_n \leq 50 \text{ MeV}$	$5,0 + 17,0e^{-\frac{\ln^2(2E_n)}{6}}$
	$E_n > 50$ MeV	$2,5 + 3,25e^{-\frac{\ln^2(0,04E_n)}{6}}$

Legend:

E_n – neutron energy

Tissue weighting factors

Organ/tissue	Tissue weighting factor w_t
Bone marrow (red)	0,12
Large intestine	0,12
Lungs	0,12
Stomach	0,12
Mammary gland	0,12
Other tissues (*)	0,12
Gonads	0,08
Bladder	0,04
Oesophagus	0,04
Liver	0,04
Thyroid gland	0,04
Bone surface	0,01
Brain	0,01
Salivary glands	0,01
Skin	0,01

Explanations:
(*)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 region, gall bladder, heart, kidneys, lymphatic nodes, muscle, oral mucosa, pancreas, prostate (in case of male), small intestine, spleen, thymus, uterus/cervix (in case of female).

Quality factors Q

Linear energy transfer L [keV/µm]	Quality factor Q (L)
less than 10	1

10 to 100	$0.32.L^{-2.2}$
more than 100	$300.L^{-0.5}$

Annex 3 to Decree No .../…Sb.

Conversion factors

Conversion factors for the conversion of the specific activity of radioactive noble gases to the effective dose for a radiation worker and an adult individual from the population

Nuclide	$T_{½}$	Conversion factor [$Sv.d^{-1}/Bq.m^{-3}$]
Ar-37	35.02 d	$4.1.10^{-15}$
Ar-39	269 y	$1.1.10^{-11}$
Ar-41	1.827 h	$5.3.10^{-9}$
Kr-74	11.50 min	$4.5.10^{-9}$
Kr-76	14.8 h	$1.6.10^{-9}$
Kr-77	74.7 min	$3.9.10^{-9}$
Kr-79	35.04 h	$9.7.10^{-10}$
Kr-81	210.000 y	$2.1.10^{-11}$
Kr-81m	13 s	$4.8.10^{-10}$
Kr-83m	1.83 h	$2.1.10^{-13}$
Kr-85	10.72 y	$2.2.10^{-11}$
Kr-85m	4.48 h	$5.9.10^{-10}$
Kr-87	76.3 min	$3.4.10^{-9}$
Kr-88	2.84 h	$8.4.10^{-9}$
Xe-120	40 min	$1.5.10^{-9}$
Xe-121	40.1 min	$7.5.10^{-9}$
Xe-122	20.1 h	$1.9.10^{-10}$
Xe-123	2.08 h	$2.4.10^{-9}$
Xe-125	17.0 h	$9.3.10^{-10}$
Xe-127	36.41 d	$9.7.10^{-10}$
Xe-129m	8.0 d	$8.1.10^{-11}$
Xe-131m	11.9 d	$3.2.10^{-11}$
Xe-133	5.245 d	$1.2.10^{-10}$
Xe-133m	2.188 d	$1.1.10^{-10}$
Xe-135m	9.09 h	$1.6.10^{-9}$
Xe-135	15.29 min	$9.6.10^{-10}$
Xe-138	14.17 min	$4.7.10^{-9}$

The type of absorption in the digestive tract for various chemical substances and compounds

Element	Chemical substance, compound	f_1
hydrogen	tritiated water (used as a fluid)	1.00
	organically bound tritium	1.00
beryllium	all compounds	0.005
carbon	marked organic compounds	1.00
fluorine	all compounds	1.00
sodium	all compounds	1.00
magnesium	all compounds	0.50
aluminium	all compounds	0.01
silicon	all compounds	0.01
phosphorus	all compounds	0.80
sulphur	inorganic compounds	0.80
	elemental sulphur	0.10
	organic sulphur compounds (in foods)	1.00
chlorine	all compounds	1.00
potassium	all compounds	1.00
calcium	all compounds	0.30
scandium	all compounds	0.0001
titanium	all compounds	0.01
vanadium	all compounds	0.01
chromium	hexavalent chromium compounds	0.10
	trivalent chromium compounds	0.01
manganese	all compounds	0.10
iron	all compounds	0.10
cobalt	all unspecified compounds	0.10
nickel	all compounds	0.05
copper	all compounds	0.50
zinc	all compounds	0.50
gallium	all compounds	0.001
germanium	all compounds	1.00
arsenic	all compounds	0.50
selenium	all unspecified compounds	0.80
	elemental selenium and selenates	0.05
bromine	all compounds	1.00
rubidium	all compounds	1.00
strontium	all unspecified compounds	0.30
	strontium titanate ($SrTiO_3$)	0.01

Element	Chemical substance, compound	f_1
yttrium	all compounds	0.0001
zirconium	all compounds	0.002
niobium	all compounds	0.01
molybdenum	all unspecified compounds	0.80
	molybdenum trisulphide	0.05
technetium	all compounds	0.80
ruthenium	all compounds	0.05
rhodium	all compounds	0.05
palladium	all compounds	0.005
silver	all compounds	0.05
cadmium	all inorganic compounds	0.05
indium	all compounds	0.02
tin	all compounds	0.02
antimony	all compounds	0.10
tellurium	all compounds	0.30
iodine	all compounds	1.00
caesium	all compounds	1.00
barium	all compounds	0.10
lanthanum	all compounds	0.0005
cerium	all compounds	0.0005
praseodymium	all compounds	0.0005
neodymium	all compounds	0.0005
promethium	all compounds	0.0005
samarium	all compounds	0.0005
europium	all compounds	0.0005
gadolinium	all compounds	0.0005
terbium	all compounds	0.0005
dysprosium	all compounds	0.0005
holmium	all compounds	0.0005
erbium	all compounds	0.0005
thulium	all compounds	0.0005
ytterbium	all compounds	0.0005
lutetium	all compounds	0.0005
hafnium	all compounds	0.002
tantalum	all compounds	0.001
wolfram	all unspecified compounds	0.30
	wolframic acid	0.01
rhenium	all compounds	0.80

Element	Chemical substance, compound	f_1
osmium	all compounds	0.01
iridium	all compounds	0.01
platinum	all compounds	0.01
gold	all compounds	0.10
mercury	all inorganic compounds	0.02
	methyl mercury	1.00
	all unspecified organic compounds	0.40
thallium	all compounds	1.00
lead	all compounds	0.20
bismuth	all compounds	0.05
polonium	all compounds	0.10
astatine	all compounds	1.00
francium	all compounds	1.00
radium	all compounds	0.20
actinium	all compounds	0.0005
thorium	all unspecified compounds	0.0005
	oxides and hydroxides	0.0002
protactinium	all compounds	0.0005
uranium	all unspecified compounds	0.02
	most quadrivalent uranium compounds, e.g. UO_2, $U3O_8$, UF_4	0.002
neptunium	all compounds	0.0005
plutonium	all unspecified compounds	0.0005
	nitrates	0.0001
	insoluble oxides	0.00001
americium	all compounds	0.0005
curium	all compounds	0.0005
berkelium	all compounds	0.0005
californium	all compounds	0.0005
einsteinium	all compounds	0.0005
fermium	all compounds	0.0005
mendelevium	all compounds	0.0005

Legend:

Absorption in the digestive tract is expressed by the coefficient f, characterising in model calculations the fraction that is transferred to body fluids in the digestive tract.
Values of the coefficient f_1 are used to calculate the conversion factors for intake via ingestion by a radiation worker.

The type of absorption in the lungs for various chemical substances and compounds

Element	Chemical substance, compound	type	f_1
beryllium	all unspecified compounds oxides, halides, and nitrates	M S	0.005 0.005
fluorine	determined by the compounding cation determined by the compounding cation determined by the compounding cation	F M S	1.00 1.00 1.00
sodium	all compounds	F	1.00
magnesium	all unspecified compounds oxides, hydroxides, carbides, halides, and nitrates	F M	0.50 0.50
aluminium	all unspecified compounds	F	0.01
	oxides, hydroxides, carbides, halides, nitrates, and metallic aluminium	M	0.01
silicon	all unspecified compounds	F	0.01
	oxides, hydroxides, carbides, and nitrates	M	0.01
	aluminosilicate glass aerosol	S	0.01
phosphorus	all unspecified compounds	F	0.80
	phosphates: determined by the compounding cation	M	0.80
sulphur	sulphides and sulphates: determined by the compounding cation	F	0.80
	elementary sulphur; sulphides and sulphates: determined by the compounding cation	M	0.80
chlorine	determined by the compounding cation	F	1.00
	determined by the compounding cation	M	1.00
potassium	all compounds	F	1.00
calcium	all compounds	M	0.30
scandium	all compounds	S	0.0001
titanium	all unspecified compounds	F	0.01
	oxides, hydroxides, carbides, halides, and nitrates	M	0.01
	strontium titanate ($SrTiO_3$)	S	0.01
vanadium	all unspecified compounds	F	0.01
	oxides, hydroxides, carbides, and halides	M	0.01
chromium	all unspecified compounds	F	0.10
	halides and nitrates	M	0.10
	oxides and hydroxides	S	0.10
manganese	all unspecified compounds	F	0.10
	oxides, hydroxides, halides, and nitrates	M	0.10
iron	all unspecified compounds	F	0.10
	oxides, hydroxides, and halides	M	0.10
cobalt	all unspecified compounds	M	0.10
	oxides, hydroxides, halides, and nitrates	S	0.05

Element	Chemical substance, compound	type	f_1
nickel	all unspecified compounds	F	0.05
	oxides, hydroxides, and carbides	M	0.05
copper	all unspecified inorganic compounds	F	0.50
	sulphides, halides, and nitrates	M	0.50
	oxides and hydroxides	S	0.50
zinc	all compounds	S	0.50
gallium	all unspecified compounds	F	0.001
	oxides, hydroxides, carbides, halides, and nitrates	M	0.001
germanium	all unspecified compounds	F	1.00
	oxides, sulphides, and halides	M	1.00
arsenic	all compounds	M	0.50
selenium	all unspecified inorganic compounds	F	0.80
	elemental selenium, oxides, hydroxides, and carbides	M	0.80
bromine	determined by the compounding cation	F	1.00
	determined by the compounding cation	M	1.00
rubidium	all compounds	F	1.00
strontium	all unspecified compounds	F	0.30
	strontium titanate ($SrTiO_3$)	S	0.01
yttrium	all unspecified compounds	M	0.0001
	oxides and hydroxides	S	0.0001
zirconium	all unspecified compounds	F	0.002
	oxides, hydroxides, halides, and nitrates	M	0.002
	zirconium carbide	S	0.002
niobium	all unspecified compounds	M	0.01
	oxides and hydroxides	S	0.01
molybdenum	all unspecified compounds	F	0.80
	molybdenum sulphide, oxides, and hydroxides	S	0.05
technetium	all unspecified compounds	F	0.80
	oxides, hydroxides, halides, and nitrates	M	0.80
ruthenium	all unspecified compounds	F	0.05
	halides	M	0.05
	oxides and hydroxides	S	0.05
rhodium	all unspecified compounds	F	0.05
	halides	M	0.05
	oxides and hydroxides	S	0.05
palladium	all unspecified compounds	F	0.005
	halides and nitrates	M	0.005

Element	**Chemical substance, compound**	**type**	f_1
	oxides and hydroxides	S	0.005
silver	all unspecified compounds and metallic silver	F	0.05
	nitrates and sulphites	M	0.05
	oxides, hydroxides, and carbides	S	0.05
cadmium	all unspecified compounds	F	0.05
	sulphides, halides, and nitrates	M	0.05
	oxides and hydroxides	S	0.05
indium	all unspecified compounds	F	0.02
	oxides, hydroxides, halides, and nitrates	M	0.02
tin	all unspecified compounds	F	0.02
	stannic phosphate, sulphides, oxides, hydroxides, halides, and nitrates	M	0.02
antimony	all unspecified compounds	F	0.10
	oxides, hydroxides, halides, sulphides, sulphates, and nitrates	M	0.01
tellurium	all unspecified compounds	F	0.30
	oxides, hydroxides, and nitrates	M	0.30
iodine	all compounds	F	1.00
caesium	all compounds	F	1.00
barium	all compounds	F	0.10
lanthanum	all unspecified compounds	F	0.0005
	oxides and hydroxides	M	0.0005
cerium	all unspecified compounds	M	0.0005
	oxides, hydroxides, and fluoride	S	0.0005
praseodymium	all unspecified compounds	M	0.0005
	oxides, hydroxides, carbides, and fluorides	S	0.0005
neodymium	all unspecified compounds	M	0.0005
	oxides, hydroxides, carbides, and fluorides	S	0.0005
promethium	all unspecified compounds	M	0.0005
	oxides, hydroxides, carbides, and fluorides	S	0.0005
samarium	all compounds	M	0.0005
europium	all compounds	M	0.0005
gadolinium	all unspecified compounds	F	0.0005
	oxides, hydroxides, and fluoride	M	0.0005
terbium	all compounds	M	0.0005
dysprosium	all compounds	M	0.0005
holmium	all unspecified compounds	M	0.0005
erbium	all compounds	M	0.0005
thulium	all compounds	M	0.0005

Element	Chemical substance, compound	type	f_1
ytterbium	all unspecified compounds	M	0.0005
	oxides, hydroxides, and fluoride	S	0.0005
lutetium	all unspecified compounds	M	0.0005
	oxides, hydroxides, and fluoride	S	0.0005
hafnium	all unspecified compounds	F	0.002
	oxides, hydroxides, halides, carbides, and nitrates	M	0.002
tantalum	all unspecified compounds	M	0.001
	elemental tantalum oxides, hydroxides, halides, carbides, nitrates, and nitrides	S	0.001
wolfram	all compounds	F	0.30
rhenium	all unspecified compounds	F	0.80
	oxides, hydroxides, halides, and nitrates	M	0.80
osmium	all unspecified compounds	F	0.01
	halides and nitrates	M	0.01
	oxides and hydroxides	S	0.01
iridium	all unspecified compounds	F	0.01
	metal iridium, halides, and nitrates	M	0.01
	oxides and hydroxides	S	0.01
platinum	all compounds	F	0.01
gold	all unspecified compounds	F	0.10
	halides and nitrates	M	0.10
	oxides and hydroxides	S	0.10
mercury	sulphates	F	0.02
	oxides, hydroxides, halides, nitrates, and sulphites	M	0.02
	all organic compounds	F	0.40
thallium	all compounds	F	1.00
lead	all compounds	F	0.20
bismuth	bismuth nitrate	F	0.05
	all unspecified compounds	M	0.05
polonium	all unspecified compounds	F	0.10
	oxides, hydroxides, and nitrates	M	0.10
astatine	determined by the compounding cation	F	1.00
	determined by the compounding cation	M	1.00
francium	all compounds	F	1.00
radium	all compounds	M	0.20
actinium	all unspecified compounds	F	0.0005
	halides and nitrates	M	0.0005
	oxides and hydroxides	S	0.0005

Element	**Chemical substance, compound**	**type**	f_1
thorium	all unspecified compounds	M	0.0005
	oxides and hydroxides	S	0.0002
protactinium	all unspecified compounds	M	0.0005
	oxides and hydroxides	S	0.0005
uranium	most hexavalent compounds, e.g. UF_6 , UO_2F_2 and $UO_2(NO_3)_2$	F	0.02
	poorly soluble compounds, e.g. UO_3, UF_4, UCl_4 and most other hexavalent compounds	M	0.02
	highly insoluble compounds, e.g. UO_2 and U_3O_8	S	0.002
neptunium	all compounds	M	0.0005
plutonium	all unspecified compounds	M	0.0005
	insoluble oxides	S	0.00001
americium	all compounds	M	0.0005
curium	all compounds	M	0.0005
berkelium	all compounds	M	0.0005
californium	all compounds	M	0.0005
einsteinium	all compounds	M	0.0005
fermium	all compounds	M	0.0005
mendelevium	all compounds	M	0.0005

Legend:

Absorption in the lungs is represented by type F, M, or S characterising in model calculations the rate at which a substance passes from the lungs to body fluids (F – fast, M - medium, S - slow), and the coefficient f_1 characterising the fraction that passes from the lungs into the digestive tract.
Values of the coefficient f_1 are used to calculate the conversion factors for intake via inhalation by a radiation worker.

Conversion factors h_{inh} for intake via inhalation of radioactive aerosols and h_{ing} for intake via ingestion by a radiation worker

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
hydrogen							
H-3 (tritiated water)	12.35 y					1	$1.8.10^{-11}$
(organically bound tritium)						1	$4.2.10^{-11}$
beryllium							
Be-7	53.3 d	M	0.005	$4.8.10^{-11}$	$4.3.10^{-11}$	0.005	$2.8.10^{-11}$
		S	0.005	$5.2.10^{-11}$	$4.6.10^{-11}$		
Be-10	1.6×10^{6} y	M	0.005	$9.1.10^{-9}$	$6.7.10^{-9}$	0.005	$1.1.10^{-9}$
		S	0.005	$3.2.10^{-8}$	$1.9.10^{-8}$		
carbon							
C-11	20.38 min					1	$2.4.10^{-11}$
C-14	5730 y					1	$5.8.10^{-10}$
fluorine							
F-18	109.77 min	F	1	$3.0.10^{-11}$	$5.4.10^{-11}$	1	$4.9.10^{-11}$
		M	1	$5.7.10^{-11}$	$8.9.10^{-11}$		
		S	1	$6.0.10^{-11}$	$9.3.10^{-11}$		
sodium							
Na-22	2.602 y	F	1	$1.3.10^{-9}$	$2.0.10^{-9}$	1	$3.2.10^{-9}$
Na-24	15.00 h	F	1	$2.9.10^{-10}$	$5.3.10^{-10}$	1	$4.3.10^{-10}$
magnesium							
Mg-28	20.91 h	F	0.5	$6.4.10^{-10}$	$1.1.10^{-9}$	0.5	$2.2.10^{-9}$
		M	0.5	$1.2.10^{-9}$	$1.7.10^{-9}$		
aluminium							
Al-26	$7.16.10^{5}$ y	F	0.01	$1.1.10^{-8}$	$1.4.10^{-8}$	0.01	$3.5.10^{-9}$
		M	0.01	$1.8.10^{-8}$	$1.2.10^{-8}$		
silicon							
Si-31	157.3 min	F	0.01	$2.9.10^{-11}$	$5.1.10^{-11}$	0.01	$1.6.10^{-10}$
		M	0.01	$7.5.10^{-11}$	$1.1.10^{-10}$		
		S	0.01	$8.0.10^{-11}$	$1.1.10^{-10}$		
Si-32	450 y	F	0.01	$3.2.10^{-9}$	$3.7.10^{-9}$	0.01	$5.6.10^{-10}$
		M	0.01	$1.5.10^{-8}$	$9.6.10^{-9}$		
		S	0.01	$1.1.10^{-7}$	$5.5.10^{-8}$		

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
phosphorus							
P-32	14.29 d	F	0.8	$8.0.10^{-10}$	$1.1.10^{-9}$	0.8	$2.4.10^{-9}$
		M	0.8	$3.2.10^{-9}$	$2.9.10^{-9}$		
P-33	25.4 d	F	0.8	$9.6.10^{-11}$	$1.4.10^{-10}$	0.8	$2.4.10^{-10}$
		M	0.8	$1.4.10^{-9}$	$1.3.10^{-9}$		
sulphur							
S-35 inorg.	87.44 d	F	0.8	$5.3.10^{-11}$	$8.0.10^{-11}$	0.8	$1.4.10^{-10}$
		M	0.8	$1.3.10^{-9}$	$1.1.10^{-9}$	0.1	$1.9.10^{-10}$
S-35 org.						1	$7.7.10^{-10}$
chlorine							
Cl-36	3.01×10^5 y	F	1	$3.4.10^{-10}$	$4.9.10^{-10}$	1	$9.3.10^{-10}$
		M	1	$6.9.10^{-9}$	$5.1.10^{-9}$		
Cl-38	37.21 min	F	1	$2.7.10^{-11}$	$4.6.10^{-11}$	1	$1.2.10^{-10}$
		M	1	$4.7.10^{-11}$	$7.3.10^{-11}$		
Cl-39	55.6 min	F	1	$2.7.10^{-11}$	$4.8.10^{-11}$	1	$8.5.10^{-11}$
		M	1	$4.8.10^{-11}$	$7.6.10^{-11}$		
potassium							
K-40	1.28×10^9 y	F	1	$2.1.10^{-9}$	$3.0.10^{-9}$	1	$6.2.10^{-9}$
K-42	12.36 h	F	1	$1.3.10^{-10}$	$2.0.10^{-10}$	1	$4.3.10^{-10}$
K-43	22.6 h	F	1	$1.5.10^{-10}$	$2.6.10^{-10}$	1	$2.5.10^{-10}$
K-44	22.13 min	F	1	$2.1.10^{-11}$	$3.7.10^{-11}$	1	$8.4.10^{-11}$
K-45	20 min	F	1	$1.6.10^{-11}$	$2.8.10^{-11}$	1	$5.4.10^{-11}$
calcium							
Ca-41	1.4×10^5 y	M	0.3	$1.7.10^{-10}$	$1.9.10^{-10}$	0.3	$2.9.10^{-10}$
Ca-45	163 d	M	0.3	$2.7.10^{-9}$	$2.3.10^{-9}$	0.3	$7.6.10^{-10}$
Ca-47	4.53 d	M	0.3	$1.8.10^{-9}$	$2.1.10^{-9}$	0.3	$1.6.10^{-9}$
scandium							
Sc-43	3.891 h	S	$1.0.10^{-4}$	$1.2.10^{-10}$	$1.8.10^{-10}$	$1.0.10^{-4}$	$1.9.10^{-10}$
Sc-44	3.927 h	S	$1.0.10^{-4}$	$1.9.10^{-10}$	$3.0.10^{-10}$	$1.0.10^{-4}$	$3.5.10^{-10}$
Sc-44m	58.6 h	S	$1.0.10^{-4}$	$1.5.10^{-9}$	$2.0.10^{-9}$	$1.0.10^{-4}$	$2.4.10^{-9}$
Sc-46	83.83 d	S	$1.0.10^{-4}$	$6.4.10^{-9}$	$4.8.10^{-9}$	$1.0.10^{-4}$	$1.5.10^{-9}$
Sc-47	3.351 d	S	$1.0.10^{-4}$	$7.0.10^{-10}$	$7.3.10^{-10}$	$1.0.10^{-4}$	$5.4.10^{-10}$
Sc-48	43.7 h	S	$1.0.10^{-4}$	$1.1.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-4}$	$1.7.10^{-9}$
Sc-49	57.4 min	S	$1.0.10^{-4}$	$4.1.10^{-11}$	$6.1.10^{-11}$	$1.0.10^{-4}$	$8.2.10^{-11}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
titanium							
Ti-44	47.3 y	F	0.01	$6.1.10^{-8}$	$7.2.10^{-8}$	0.01	$5.8.10^{-9}$
		M	0.01	$4.0.10^{-8}$	$2.7.10^{-8}$		
		S	0.01	$1.2.10^{-7}$	$6.2.10^{-8}$		
Ti-45	3.08 h	F	0.01	$4.6.10^{-11}$	$8.3.10^{-11}$	0.01	$1.5.10^{-10}$
		M	0.01	$9.1.10^{-11}$	$1.4.10^{-10}$		
		S	0.01	$9.6.10^{-11}$	$1.5.10^{-10}$		
vanadium							
V-47	32.6 min	F	0.01	$1.9.10^{-11}$	$3.2.10^{-11}$	0.01	$6.3.10^{-11}$
		M	0.01	$3.1.10^{-11}$	$5.0.10^{-11}$		
V-48	16.238 d	F	0.01	$1.1.10^{-9}$	$1.7.10^{-9}$	0.01	$2.0.10^{-9}$
		M	0.01	$2.3.10^{-9}$	$2.7.10^{-9}$		
V-49	330 d	F	0.01	$2.1.10^{-11}$	$2.6.10^{-11}$	0.01	$1.8.10^{-11}$
		M	0.01	$3.2.10^{-11}$	$2.3.10^{-11}$		
chromium							
Cr-48	22.96 h	F	0.1	$1.0.10^{-10}$	$1.7.10^{-10}$	0.1	$2.0.10^{-10}$
		M	0.1	$2.0.10^{-10}$	$2.3.10^{-10}$	0.01	$2.0.10^{-10}$
		S	0.1	$2.2.10^{-10}$	$2.5.10^{-10}$		
Cr-49	42.09 min	F	0.1	$2.0.10^{-11}$	$3.5.10^{-11}$	0.1	$6.1.10^{-11}$
		M	0.1	$3.5.10^{-11}$	$5.6.10^{-11}$	0.01	$6.1.10^{-11}$
		S	0.1	$3.7.10^{-11}$	$5.9.10^{-11}$		
Cr-51	27.704 d	F	0.1	$2.1.10^{-11}$	$3.0.10^{-11}$	0.1	$3.8.10^{-11}$
		M	0.1	$3.1.10^{-11}$	$3.4.10^{-11}$	0.01	$3.7.10^{-11}$
		S	0.1	$3.6.10^{-11}$	$3.6.10^{-11}$		
manganese							
Mn-51	46.2 min	F	0.1	$2.4.10^{-11}$	$4.2.10^{-11}$	0.1	$9.3.10^{-11}$
		M	0.1	$4.3.10^{-11}$	$6.8.10^{-11}$		
Mn-52	5.591 d	F	0.1	$9.9.10^{-10}$	$1.6.10^{-9}$	0.1	$1.8.10^{-9}$
		M	0.1	$1.4.10^{-9}$	$1.8.10^{-9}$		
Mn-52m	21.1 min	F	0.1	$2.0.10^{-11}$	$3.5.10^{-11}$	0.1	$6.9.10^{-11}$
		M	0.1	$3.0.10^{-11}$	$5.0.10^{-11}$		
Mn-53	3.7 x 10^6 y	F	0.1	$2.9.10^{-11}$	$3.6.10^{-11}$	0.1	$3.0.10^{-11}$
		M	0.1	$5.2.10^{-11}$	$3.6.10^{-11}$		
Mn-54	312.5 d	F	0.1	$8.7.10^{-10}$	$1.1.10^{-9}$	0.1	$7.1.10^{-10}$
		M	0.1	$1.5.10^{-9}$	$1.2.10^{-9}$		

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
Mn-56	2.5785 h	F	0.1	$6.9.10^{-11}$	$1.2.10^{-10}$	0.1	$2.5.10^{-10}$
		M	0.1	$1.3.10^{-10}$	$2.0.10^{-10}$		
iron							
Fe-52	8.275 h	F	0.1	$4.1.10^{-10}$	$6.9.10^{-10}$	0.1	$1.4.10^{-9}$
		M	0.1	$6.3.10^{-10}$	$9.5.10^{-10}$		
Fe-55	2.7 y	F	0.1	$7.7.10^{-10}$	$9.2.10^{-10}$	0.1	$3.3.10^{-10}$
		M	0.1	$3.7.10^{-10}$	$3.3.10^{-10}$		
Fe-59	44.529 d	F	0.1	$2.2.10^{-9}$	$3.0.10^{-9}$	0.1	$1.8.10^{-9}$
		M	0.1	$3.5.10^{-9}$	$3.2.10^{-9}$		
Fe-60	1 x 10^5 y	F	0.1	$2.8.10^{-7}$	$3.3.10^{-7}$	0.1	$1.1.10^{-7}$
		M	0.1	$1.3.10^{-7}$	$1.2.10^{-7}$		
cobalt							
Co-55	17.54 h	M	0.1	$5.1.10^{-10}$	$7.8.10^{-10}$	0.1	$1.0.10^{-9}$
		S	0.05	$5.5.10^{-10}$	$8.3.10^{-10}$	0.05	$1.1.10^{-9}$
Co-56	78.76 d	M	0.1	$4.6.10^{-9}$	$4.0.10^{-9}$	0.1	$2.5.10^{-9}$
		S	0.05	$6.3.10^{-9}$	$4.9.10^{-9}$	0.05	$2.3.10^{-9}$
Co-57	270.9 d	M	0.1	$5.2.10^{-10}$	$3.9.10^{-10}$	0.1	$2.1.10^{-10}$
		S	0.05	$9.4.10^{-10}$	$6.0.10^{-10}$	0.05	$1.9.10^{-10}$
Co-58	70.80 d	M	0.1	$1.5.10^{-9}$	$1.4.10^{-9}$	0.1	$7.4.10^{-10}$
		S	0.05	$2.0.10^{-9}$	$1.7.10^{-9}$	0.05	$7.0.10^{-10}$
Co-58m	9.15 h	M	0.1	$1.3.10^{-11}$	$1.5.10^{-11}$	0.1	$2.4.10^{-11}$
		S	0.05	$1.6.10^{-11}$	$1.7.10^{-11}$	0.05	$2.4.10^{-11}$
Co-60	5.271 y	M	0.1	$9.6.10^{-9}$	$7.1.10^{-9}$	0.1	$3.4.10^{-9}$
		S	0.05	$2.9.10^{-8}$	$1.7.10^{-8}$	0.05	$2.5.10^{-9}$
Co-60m	10.47 min	M	0.1	$1.1.10^{-12}$	$1.2.10^{-12}$	0.1	$1.7.10^{-12}$
		S	0.05	$1.3.10^{-12}$	$1.2.10^{-12}$	0.05	$1.7.10^{-12}$
Co-61	1.65 h	M	0.1	$4.8.10^{-11}$	$7.1.10^{-11}$	0.1	$7.4.10^{-11}$
		S	0.05	$5.1.10^{-11}$	$7.5.10^{-11}$	0.05	$7.4.10^{-11}$
Co-62m	13.91 min	M	0.1	$2.1.10^{-11}$	$3.6.10^{-11}$	0.1	$4.7.10^{-11}$
		S	0.05	$2.2.10^{-11}$	$3.7.10^{-11}$	0.05	$4.7.10^{-11}$
nickel							
Ni-56	6.10 d	F	0.05	$5.1.10^{-10}$	$7.9.10^{-10}$	0.05	$8.6.10^{-10}$
		M	0.05	$8.6.10^{-10}$	$9.6.10^{-10}$		
Ni-57	36.08 h	F	0.05	$2.8.10^{-10}$	$5.0.10^{-10}$	0.05	$8.7.10^{-10}$
		M	0.05	$5.1.10^{-10}$	$7.6.10^{-10}$		

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
Ni-59	7.5 x 10^4 y	F	0.05	$1.8.10^{-10}$	$2.2.10^{-10}$	0.05	$6.3.10^{-11}$
		M	0.05	$1.3.10^{-10}$	$9.4.10^{-11}$		
Ni-63	96 y	F	0.05	$4.4.10^{-10}$	$5.2.10^{-10}$	0.05	$1.5.10^{-10}$
		M	0.05	$4.4.10^{-10}$	$3.1.10^{-10}$		
Ni-65	2.520 h	F	0.05	$4.4.10^{-11}$	$7.5.10^{-11}$	0.05	$1.8.10^{-10}$
		M	0.05	$8.7.10^{-11}$	$1.3.10^{-10}$		
Ni-66	54.6 h	F	0.05	$4.5.10^{-10}$	$7.6.10^{-10}$	0.05	$3.0.10^{-9}$
		M	0.05	$1.6.10^{-9}$	$1.9.10^{-9}$		
copper							
Cu-60	23.2 min	F	0.5	$2.4.10^{-11}$	$4.4.10^{-11}$	0.5	$7.0.10^{-11}$
		M	0.5	$3.5.10^{-11}$	$6.0.10^{-11}$		
		S	0.5	$3.6.10^{-11}$	$6.2.10^{-11}$		
Cu-61	3.408 h	F	0.5	$4.0.10^{-11}$	$7.3.10^{-11}$	0.5	$1.2.10^{-10}$
		M	0.5	$7.6.10^{-11}$	$1.2.10^{-10}$		
		S	0.5	$8.0.10^{-11}$	$1.2.10^{-10}$		
Cu-64	12.701 h	F	0.5	$3.8.10^{-11}$	$6.8.10^{-11}$	0.5	$1.2.10^{-10}$
		M	0.5	$1.1.10^{-10}$	$1.5.10^{-10}$		
		S	0.5	$1.2.10^{-10}$	$1.5.10^{-10}$		
Cu-67	61.86 h	F	0.5	$1.1.10^{-10}$	$1.8.10^{-10}$	0.5	$3.4.10^{-10}$
		M	0.5	$5.2.10^{-10}$	$5.3.10^{-10}$		
		S	0.5	$5.8.10^{-10}$	$5.8.10^{-10}$		
zinc							
Zn-62	9.26 h	S	0.5	$4.7.10^{-10}$	$6.6.10^{-10}$	0.5	$9.4.10^{-10}$
Zn-63	38.1 min	S	0.5	$3.8.10^{-11}$	$6.1.10^{-11}$	0.5	$7.9.10^{-11}$
Zn-65	243.9 d	S	0.5	$2.9.10^{-9}$	$2.8.10^{-9}$	0.5	$3.9.10^{-9}$
Zn-69	57 min	S	0.5	$2.8.10^{-11}$	$4.3.10^{-11}$	0.5	$3.1.10^{-11}$
Zn-69m	13.76 h	S	0.5	$2.6.10^{-10}$	$3.3.10^{-10}$	0.5	$3.3.10^{-10}$
Zn-71m	3.92 h	S	0.5	$1.6.10^{-10}$	$2.4.10^{-10}$	0.5	$2.4.10^{-10}$
Zn-72	46.5 h	S	0.5	$1.2.10^{-9}$	$1.5.10^{-9}$	0.5	$1.4.10^{-9}$
gallium							
Ga-65	15.2 min	F	0.001	$1.2.10^{-11}$	$2.0.10^{-11}$	0.001	$3.7.10^{-11}$
		M	0.001	$1.8.10^{-11}$	$2.9.10^{-11}$		
Ga-66	9.40 h	F	0.001	$2.7.10^{-10}$	$4.7.10^{-10}$	0.001	$1.2.10^{-9}$
		M	0.001	$4.6.10^{-10}$	$7.1.10^{-10}$		
Ga-67	78.26 h	F	0.001	$6.8.10^{-11}$	$1.1.10^{-10}$	0.001	$1.9.10^{-10}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		M	0.001	$2.3.10^{-10}$	$2.8.10^{-10}$		
Ga-68	68.0 min	F	0.001	$2.8.10^{-11}$	$4.9.10^{-11}$	0.001	$1.0.10^{-10}$
		M	0.001	$5.1.10^{-11}$	$8.1.10^{-11}$		
Ga-70	21.15 min	F	0.001	$9.3.10^{-12}$	$1.6.10^{-11}$	0.001	$3.1.10^{-11}$
		M	0.001	$1.6.10^{-11}$	$2.6.10^{-11}$		
Ga-72	14.1 h	F	0.001	$3.1.10^{-10}$	$5.6.10^{-10}$	0.001	$1.1.10^{-9}$
		M	0.001	$5.5.10^{-10}$	$8.4.10^{-10}$		
Ga-73	4.91 h	F	0.001	$5.8.10^{-11}$	$1.0.10^{-10}$	0.001	$2.6.10^{-10}$
		M	0.001	$1.5.10^{-10}$	$2.0.10^{-10}$		
germanium							
Ge-66	2.27 h	F	1	$5.7.10^{-11}$	$9.9.10^{-11}$	1	$1.0.10^{-10}$
		M	1	$9.2.10^{-11}$	$1.3.10^{-10}$		
Ge-67	18.7 min	F	1	$1.6.10^{-11}$	$2.8.10^{-11}$	1	$6.5.10^{-11}$
		M	1	$2.6.10^{-11}$	$4.2.10^{-11}$		
Ge-68	288 d	F	1	$5.4.10^{-10}$	$8.3.10^{-10}$	1	$1.3.10^{-9}$
		M	1	$1.3.10^{-8}$	$7.9.10^{-9}$		
Ge-69	39.05 h	F	1	$1.4.10^{-10}$	$2.5.10^{-10}$	1	$2.4.10^{-10}$
		M	1	$2.9.10^{-10}$	$3.7.10^{-10}$		
Ge-71	11.8 d	F	1	$5.0.10^{-12}$	$7.8.10^{-12}$	1	$1.2.10^{-11}$
		M	1	$1.0.10^{-11}$	$1.1.10^{-11}$		
Ge-75	82.78 min	F	1	$1.6.10^{-11}$	$2.7.10^{-11}$	1	$4.6.10^{-11}$
		M	1	$3.7.10^{-11}$	$5.4.10^{-11}$		
Ge-77	11.30 h	F	1	$1.5.10^{-10}$	$2.5.10^{-10}$	1	$3.3.10^{-10}$
		M	1	$3.6.10^{-10}$	$4.5.10^{-10}$		
Ge-78	87 min	F	1	$4.8.10^{-11}$	$8.1.10^{-11}$	1	$1.2.10^{-10}$
		M	1	$9.7.10^{-11}$	$1.4.10^{-10}$		
arsenic							
As-69	15.2 min	M	0.5	$2.2.10^{-11}$	$3.5.10^{-11}$	0.5	$5.7.10^{-11}$
As-70	52.6 min	M	0.5	$7.2.10^{-11}$	$1.2.10^{-10}$	0.5	$1.3.10^{-10}$
As-71	64.8 h	M	0.5	$4.0.10^{-10}$	$5.0.10^{-10}$	0.5	$4.6.10^{-10}$
As-72	26.0 h	M	0.5	$9.2.10^{-10}$	$1.3.10^{-9}$	0.5	$1.8.10^{-9}$
As-73	80.30 d	M	0.5	$9.3.10^{-10}$	$6.5.10^{-10}$	0.5	$2.6.10^{-10}$
As-74	17.76 d	M	0.5	$2.1.10^{-9}$	$1.8.10^{-9}$	0.5	$1.3.10^{-9}$
As-76	26.32 h	M	0.5	$7.4.10^{-10}$	$9.2.10^{-10}$	0.5	$1.6.10^{-9}$
As-77	38.8 h	M	0.5	$3.8.10^{-10}$	$4.2.10^{-10}$	0.5	$4.0.10^{-10}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
As-78	90.7 min	M	0.5	$9.2.10^{-11}$	$1.4.10^{-10}$	0.5	$2.1.10^{-10}$
selenium							
Se-70	41.0 min	F	0.8	$4.5.10^{-11}$	$8.2.10^{-11}$	0.8	$1.2.10^{-10}$
		M	0.8	$7.3.10^{-11}$	$1.2.10^{-10}$	0.05	$1.4.10^{-10}$
Se-73	7.15 h	F	0.8	$8.6.10^{-11}$	$1.5.10^{-10}$	0.8	$2.1.10^{-10}$
		M	0.8	$1.6.10^{-10}$	$2.4.10^{-10}$	0.05	$3.9.10^{-10}$
Se-73m	39 min	F	0.8	$9.9.10^{-12}$	$1.7.10^{-11}$	0.8	$2.8.10^{-11}$
		M	0.8	$1.8.10^{-11}$	$2.7.10^{-11}$	0.05	$4.1.10^{-11}$
Se-75	119.8 d	F	0.8	$1.0.10^{-9}$	$1.4.10^{-9}$	0.8	$2.6.10^{-9}$
		M	0.8	$1.4.10^{-9}$	$1.7.10^{-9}$	0.05	$4.1.10^{-10}$
Se-79	65000 y	F	0.8	$1.2.10^{-9}$	$1.6.10^{-9}$	0.8	$2.9.10^{-9}$
		M	0.8	$2.9.10^{-9}$	$3.1.10^{-9}$	0.05	$3.9.10^{-10}$
Se-81	18.5 min	F	0.8	$8.6.10^{-12}$	$1.4.10^{-11}$	0.8	$2.7.10^{-11}$
		M	0.8	$1.5.10^{-11}$	$2.4.10^{-11}$	0.05	$2.7.10^{-11}$
Se-81m	57.25 min	F	0.8	$1.7.10^{-11}$	$3.0.10^{-11}$	0.8	$5.3.10^{-11}$
		M	0.8	$4.7.10^{-11}$	$6.8.10^{-11}$	0.05	$5.9.10^{-11}$
Se-83	22.5 min	F	0.8	$1.9.10^{-11}$	$3.4.10^{-11}$	0.8	$4.7.10^{-11}$
		M	0.8	$3.3.10^{-11}$	$5.3.10^{-11}$	0.05	$5.1.10^{-11}$
bromine							
Br-74	25.3 min	F	1	$2.8.10^{-11}$	$5.0.10^{-11}$	1	$8.4.10^{-11}$
		M	1	$4.1.10^{-11}$	$6.8.10^{-11}$		
Br-74m	41.5 min	F	1	$4.2.10^{-11}$	$7.5.10^{-11}$	1	$1.4.10^{-10}$
		M	1	$6.5.10^{-11}$	$1.1.10^{-10}$		
Br-75	98 min	F	1	$3.1.10^{-11}$	$5.6.10^{-11}$	1	$7.9.10^{-11}$
		M	1	$5.5.10^{-11}$	$8.5.10^{-11}$		
Br-76	16.2 h	F	1	$2.6.10^{-10}$	$4.5.10^{-10}$	1	$4.6.10^{-10}$
		M	1	$4.2.10^{-10}$	$5.8.10^{-10}$		
Br-77	56 h	F	1	$6.7.10^{-11}$	$1.2.10^{-10}$	1	$9.6.10^{-11}$
		M	1	$8.7.10^{-11}$	$1.3.10^{-10}$		
Br-80	17.4 min	F	1	$6.3.10^{-12}$	$1.1.10^{-11}$	1	$3.1.10^{-11}$
		M	1	$1.0.10^{-11}$	$1.7.10^{-11}$		
Br-80m	4.42 h	F	1	$3.5.10^{-11}$	$5.8.10^{-11}$	1	$1.1.10^{-10}$
		M	1	$7.6.10^{-11}$	$1.0.10^{-10}$		
Br-82	35.30 h	F	1	$3.7.10^{-10}$	$6.4.10^{-10}$	1	$5.4.10^{-10}$
		M	1	$6.4.10^{-10}$	$8.8.10^{-10}$		

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
Br-83	2.39 h	F	1	$1.7.10^{-11}$	$2.9.10^{-11}$	1	$4.3.10^{-11}$
		M	1	$4.8.10^{-11}$	$6.7.10^{-11}$		
Br-84	31.80 min	F	1	$2.3.10^{-11}$	$4.0.10^{-11}$	1	$8.8.10^{-11}$
		M	1	$3.9.10^{-11}$	$6.2.10^{-11}$		
rubidium							
Rb-79	22.9 min	F	1	$1.7.10^{-11}$	$3.0.10^{-11}$	1	$5.0.10^{-11}$
Rb-81	4.58 h	F	1	$3.7.10^{-11}$	$6.8.10^{-11}$	1	$5.4.10^{-11}$
Rb-81m	32 min	F	1	$7.3.10^{-12}$	$1.3.10^{-11}$	1	$9.7.10^{-12}$
Rb-82m	6.2 h	F	1	$1.2.10^{-10}$	$2.2.10^{-10}$	1	$1.3.10^{-10}$
Rb-83	86.2 d	F	1	$7.1.10^{-10}$	$1.0.10^{-9}$	1	$1.9.10^{-9}$
Rb-84	32.77 d	F	1	$1.1.10^{-9}$	$1.5.10^{-9}$	1	$2.8.10^{-9}$
Rb-86	18.66 d	F	1	$9.6.10^{-10}$	$1.3.10^{-9}$	1	$2.8.10^{-9}$
Rb-87	4.7×10^{10} y	F	1	$5.1.10^{-10}$	$7.6.10^{-10}$	1	$1.5.10^{-9}$
Rb-88	17.8 min	F	1	$1.7.10^{-11}$	$2.8.10^{-11}$	1	$9.0.10^{-11}$
Rb-89	15.2 min	F	1	$1.4.10^{-11}$	$2.5.10^{-11}$	1	$4.7.10^{-11}$
strontium							
Sr-80	100 min	F	0.3	$7.6.10^{-11}$	$1.3.10^{-10}$	0.3	$3.4.10^{-10}$
		S	0.01	$1.4.10^{-10}$	$2.1.10^{-10}$	0.01	$3.5.10^{-10}$
Sr-81	25.5 min	F	0.3	$2.2.10^{-11}$	$3.9.10^{-11}$	0.3	$7.7.10^{-11}$
		S	0.01	$3.8.10^{-11}$	$6.1.10^{-11}$	0.01	$7.8.10^{-11}$
Sr-82	25.0 d	F	0.3	$2.2.10^{-9}$	$3.3.10^{-9}$	0.3	$6.1.10^{-9}$
		S	0.01	$1.0.10^{-8}$	$7.7.10^{-9}$	0.01	$6.0.10^{-9}$
Sr-83	32.4 h	F	0.3	$1.7.10^{-10}$	$3.0.10^{-10}$	0.3	$4.9.10^{-10}$
		S	0.01	$3.4.10^{-10}$	$4.9.10^{-10}$	0.01	$5.8.10^{-10}$
Sr-85	64.84 d	F	0.3	$3.9.10^{-10}$	$5.6.10^{-10}$	0.3	$5.6.10^{-10}$
		S	0.01	$7.7.10^{-10}$	$6.4.10^{-10}$	0.01	$3.3.10^{-10}$
Sr-85m	69.5 min	F	0.3	$3.1.10^{-12}$	$5.6.10^{-12}$	0.3	$6.1.10^{-12}$
		S	0.01	$4.5.10^{-12}$	$7.4.10^{-12}$	0.01	$6.1.10^{-12}$
Sr-87m	2.805 h	F	0.3	$1.2.10^{-11}$	$2.2.10^{-11}$	0.3	$3.0.10^{-11}$
		S	0.01	$2.2.10^{-11}$	$3.5.10^{-11}$	0.01	$3.3.10^{-11}$
Sr-89	50.5 d	F	0.3	$1.0.10^{-9}$	$1.4.10^{-9}$	0.3	$2.6.10^{-9}$
		S	0.01	$7.5.10^{-9}$	$5.6.10^{-9}$	0.01	$2.3.10^{-9}$
Sr-90	29.12 y	F	0.3	$2.4.10^{-8}$	$3.0.10^{-8}$	0.3	$2.8.10^{-8}$
		S	0.01	$1.5.10^{-7}$	$7.7.10^{-8}$	0.01	$2.7.10^{-9}$
Sr-91	9.5 h	F	0.3	$1.7.10^{-10}$	$2.9.10^{-10}$	0.3	$6.5.10^{-10}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		S	0.01	$4.1.10^{-10}$	$5.7.10^{-10}$	0.01	$7.6.10^{-10}$
Sr-92	2.71 h	F	0.3	$1.1.10^{-10}$	$1.8.10^{-10}$	0.3	$4.3.10^{-10}$
		S	0.01	$2.3.10^{-10}$	$3.4.10^{-10}$	0.01	$4.9.10^{-10}$
yttrium							
Y-86	14.74 h	M	$1.0.10^{-4}$	$4.8.10^{-10}$	$8.0.10^{-10}$	$1.0.10^{-4}$	$9.6.10^{-10}$
		S	$1.0.10^{-4}$	$4.9.10^{-10}$	$8.1.10^{-10}$		
Y-86m	48 min	M	$1.0.10^{-4}$	$2.9.10^{-11}$	$4.8.10^{-11}$	$1.0.10^{-4}$	$5.6.10^{-11}$
		S	$1.0.10^{-4}$	$3.0.10^{-11}$	$4.9.10^{-11}$		
Y-87	80.3 h	M	$1.0.10^{-4}$	$3.8.10^{-10}$	$5.2.10^{-10}$	$1.0.10^{-4}$	$5.5.10^{-10}$
		S	$1.0.10^{-4}$	$4.0.10^{-10}$	$5.3.10^{-10}$		
Y-88	106.64 d	M	$1.0.10^{-4}$	$3.9.10^{-9}$	$3.3.10^{-9}$	$1.0.10^{-4}$	$1.3.10^{-9}$
		S	$1.0.10^{-4}$	$4.1.10^{-9}$	$3.0.10^{-9}$		
Y-90	64.0 h	M	$1.0.10^{-4}$	$1.4.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-4}$	$2.7.10^{-9}$
		S	$1.0.10^{-4}$	$1.5.10^{-9}$	$1.7.10^{-9}$		
Y-90m	3.19 h	M	$1.0.10^{-4}$	$9.6.10^{-11}$	$1.3.10^{-10}$	$1.0.10^{-4}$	$1.7.10^{-10}$
		S	$1.0.10^{-4}$	$1.0.10^{-10}$	$1.3.10^{-10}$		
Y-91	58.51 d	M	$1.0.10^{-4}$	$6.7.10^{-9}$	$5.2.10^{-9}$	$1.0.10^{-4}$	$2.4.10^{-9}$
		S	$1.0.10^{-4}$	$8.4.10^{-9}$	$6.1.10^{-9}$		
Y-91m	49.71 min	M	$1.0.10^{-4}$	$1.0.10^{-11}$	$1.4.10^{-11}$	$1.0.10^{-4}$	$1.1.10^{-11}$
		S	$1.0.10^{-4}$	$1.1.10^{-11}$	$1.5.10^{-11}$		
Y-92	3.54 h	M	$1.0.10^{-4}$	$1.9.10^{-10}$	$2.7.10^{-10}$	$1.0.10^{-4}$	$4.9.10^{-10}$
		S	$1.0.10^{-4}$	$2.0.10^{-10}$	$2.8.10^{-10}$		
Y-93	10.1 h	M	$1.0.10^{-4}$	$4.1.10^{-10}$	$5.7.10^{-10}$	$1.0.10^{-4}$	$1.2.10^{-9}$
		S	$1.0.10^{-4}$	$4.3.10^{-10}$	$6.0.10^{-10}$		
Y-94	19.1 min	M	$1.0.10^{-4}$	$2.8.10^{-11}$	$4.4.10^{-11}$	$1.0.10^{-4}$	$8.1.10^{-11}$
		S	$1.0.10^{-4}$	$2.9.10^{-11}$	$4.6.10^{-11}$		
Y-95	10.7 min	M	$1.0.10^{-4}$	$1.6.10^{-11}$	$2.5.10^{-11}$	$1.0.10^{-4}$	$4.6.10^{-11}$
		S	$1.0.10^{-4}$	$1.7.10^{-11}$	$2.6.10^{-11}$		
zirconium							
Zr-86	16.5 h	F	0.002	$3.0.10^{-10}$	$5.2.10^{-10}$	0.002	$8.6.10^{-10}$
		M	0.002	$4.3.10^{-10}$	$6.8.10^{-10}$		
		S	0.002	$4.5.10^{-10}$	$7.0.10^{-10}$		
Zr-88	83.4 d	F	0.002	$3.5.10^{-9}$	$4.1.10^{-9}$	0.002	$3.3.10^{-10}$
		M	0.002	$2.5.10^{-9}$	$1.7.10^{-9}$		
		S	0.002	$3.3.10^{-9}$	$1.8.10^{-9}$		

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
Zr-89	78.43 h	F	0.002	$3.1.10^{-10}$	$5.2.10^{-10}$	0.002	$7.9.10^{-10}$
		M	0.002	$5.3.10^{-10}$	$7.2.10^{-10}$		
		S	0.002	$5.5.10^{-10}$	$7.5.10^{-10}$		
Zr-93	1.53 x 10^6 y	F	0.002	$2.5.10^{-8}$	$2.9.10^{-8}$	0.002	$2.8.10^{-10}$
		M	0.002	$9.6.10^{-9}$	$6.6.10^{-9}$		
		S	0.002	$3.1.10^{-9}$	$1.7.10^{-9}$		
Zr-95	63.98 d	F	0.002	$2.5.10^{-9}$	$3.0.10^{-9}$	0.002	$8.8.10^{-10}$
		M	0.002	$4.5.10^{-9}$	$3.6.10^{-9}$		
		S	0.002	$5.5.10^{-9}$	$4.2.10^{-9}$		
Zr-97	16.90 h	F	0.002	$4.2.10^{-10}$	$7.4.10^{-10}$	0.002	$2.1.10^{-9}$
		M	0.002	$9.4.10^{-10}$	$1.3.10^{-9}$		
		S	0.002	$1.0.10^{-9}$	$1.4.10^{-9}$		
niobium							
Nb-88	14.3 min	M	0.01	$2.9.10^{-11}$	$4.8.10^{-11}$	0.01	$6.3.10^{-11}$
		S	0.01	$3.0.10^{-11}$	$5.0.10^{-11}$		
Nb-89	122 min	M	0.01	$1.2.10^{-10}$	$1.8.10^{-10}$	0.01	$3.0.10^{-10}$
		S	0.01	$1.3.10^{-10}$	$1.9.10^{-10}$		
Nb-89m	66 min	M	0.01	$7.1.10^{-11}$	$1.1.10^{-10}$	0.01	$1.4.10^{-10}$
		S	0.01	$7.4.10^{-11}$	$1.2.10^{-10}$		
Nb-90	14.60 h	M	0.01	$6.6.10^{-10}$	$1.0.10^{-9}$	0.01	$1.2.10^{-9}$
		S	0.01	$6.9.10^{-10}$	$1.1.10^{-9}$		
Nb-93m	13.6 y	M	0.01	$4.6.10^{-10}$	$2.9.10^{-10}$	0.01	$1.2.10^{-10}$
		S	0.01	$1.6.10^{-9}$	$8.6.10^{-10}$		
Nb-94	2.03 x 10^4 y	M	0.01	$1.0.10^{-8}$	$7.2.10^{-9}$	0.01	$1.7.10^{-9}$
		S	0.01	$4.5.10^{-8}$	$2.5.10^{-8}$		
Nb-95	35.15 d	M	0.01	$1.4.10^{-9}$	$1.3.10^{-9}$	0.01	$5.8.10^{-10}$
		S	0.01	$1.6.10^{-9}$	$1.3.10^{-9}$		
Nb-95m	86.6 h	M	0.01	$7.6.10^{-10}$	$7.7.10^{-10}$	0.01	$5.6.10^{-10}$
		S	0.01	$8.5.10^{-10}$	$8.5.10^{-10}$		
Nb-96	23.35 h	M	0.01	$6.5.10^{-10}$	$9.7.10^{-10}$	0.01	$1.1.10^{-9}$
		S	0.01	$6.8.10^{-10}$	$1.0.10^{-9}$		
Nb-97	72.1 min	M	0.01	$4.4.10^{-11}$	$6.9.10^{-11}$	0.01	$6.8.10^{-11}$
		S	0.01	$4.7.10^{-11}$	$7.2.10^{-11}$		
Nb-98m	51.5 min	M	0.01	$5.9.10^{-11}$	$9.6.10^{-11}$	0.01	$1.1.10^{-10}$
		S	0.01	$6.1.10^{-11}$	$9.9.10^{-11}$		

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
molybdenum							
Mo-90	5.67 h	F	0.8	$1.7.10^{-10}$	$2.9.10^{-10}$	0.8	$3.1.10^{-10}$
		S	0.05	$3.7.10^{-10}$	$5.6.10^{-10}$	0.05	$6.2.10^{-10}$
Mo-93	3.5×10^3 y	F	0.8	$1.0.10^{-9}$	$1.4.10^{-9}$	0.8	$2.6.10^{-9}$
		S	0.05	$2.2.10^{-9}$	$1.2.10^{-9}$	0.05	$2.0.10^{-10}$
Mo-93m	6.85 h	F	0.8	$1.0.10^{-10}$	$1.9.10^{-10}$	0.8	$1.6.10^{-10}$
		S	0.05	$1.8.10^{-10}$	$3.0.10^{-10}$	0.05	$2.8.10^{-10}$
Mo-99	66.0 h	F	0.8	$2.3.10^{-10}$	$3.6.10^{-10}$	0.8	$7.4.10^{-10}$
		S	0.05	$9.7.10^{-10}$	$1.1.10^{-9}$	0.05	$1.2.10^{-9}$
Mo-101	14.62 min	F	0.8	$1.5.10^{-11}$	$2.7.10^{-11}$	0.8	$4.2.10^{-11}$
		S	0.05	$2.7.10^{-11}$	$4.5.10^{-11}$	0.05	$4.2.10^{-11}$
technetium							
Tc-93	2.75 h	F	0.8	$3.4.10^{-11}$	$6.2.10^{-11}$	0.8	$4.9.10^{-11}$
		M	0.8	$3.6.10^{-11}$	$6.5.10^{-11}$		
Tc-93m	43.5 min	F	0.8	$1.5.10^{-11}$	$2.6.10^{-11}$	0.8	$2.4.10^{-11}$
		M	0.8	$1.7.10^{-11}$	$3.1.10^{-11}$		
Tc-94	293 min	F	0.8	$1.2.10^{-10}$	$2.1.10^{-10}$	0.8	$1.8.10^{-10}$
		M	0.8	$1.3.10^{-10}$	$2.2.10^{-10}$		
Tc-94m	52 min	F	0.8	$4.3.10^{-11}$	$6.9.10^{-11}$	0.8	$1.1.10^{-10}$
		M	0.8	$4.9.10^{-11}$	$8.0.10^{-11}$		
Tc-95	20.0 h	F	0.8	$1.0.10^{-10}$	$1.8.10^{-10}$	0.8	$1.6.10^{-10}$
		M	0.8	$1.0.10^{-10}$	$1.8.10^{-10}$		
Tc-95m	61 d	F	0.8	$3.1.10^{-10}$	$4.8.10^{-10}$	0.8	$6.2.10^{-10}$
		M	0.8	$8.7.10^{-10}$	$8.6.10^{-10}$		
Tc-96	4.28 d	F	0.8	$6.0.10^{-10}$	$9.8.10^{-10}$	0.8	$1.1.10^{-9}$
		M	0.8	$7.1.10^{-10}$	$1.0.10^{-9}$		
Tc-96m	51.5 min	F	0.8	$6.5.10^{-12}$	$1.1.10^{-11}$	0.8	$1.3.10^{-11}$
		M	0.8	$7.7.10^{-12}$	$1.1.10^{-11}$		
Tc-97	2.6×10^6 y	F	0.8	$4.5.10^{-11}$	$7.2.10^{-11}$	0.8	$8.3.10^{-11}$
		M	0.8	$2.1.10^{-10}$	$1.6.10^{-10}$		
Tc-97m	87 d	F	0.8	$2.8.10^{-10}$	$4.0.10^{-10}$	0.8	$6.6.10^{-10}$
		M	0.8	$3.1.10^{-9}$	$2.7.10^{-9}$		
Tc-98	4.2×10^6 y	F	0.8	$1.0.10^{-9}$	$1.5.10^{-9}$	0.8	$2.3.10^{-9}$
		M	0.8	$8.1.10^{-9}$	$6.1.10^{-9}$		
Tc-99	2.13×10^5 y	F	0.8	$2.9.10^{-10}$	$4.0.10^{-10}$	0.8	$7.8.10^{-10}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq]		f_1	h_{ing} [Sv/Bq]
				d_{ama} = 1 µm	d_{ama} = 5 µm		
		M	0.8	$3.9.10^{-9}$	$3.2.10^{-9}$		
Tc-99m	6.02 h	F	0.8	$1.2.10^{-11}$	$2.0.10^{-11}$	0.8	$2.2.10^{-11}$
		M	0.8	$1.9.10^{-11}$	$2.9.10^{-11}$		
Tc-101	14.2 min	F	0.8	$8.7.10^{-12}$	$1.5.10^{-11}$	0.8	$1.9.10^{-11}$
		M	0.8	$1.3.10^{-11}$	$2.1.10^{-11}$		
Tc-104	18.2 min	F	0.8	$2.4.10^{-11}$	$3.9.10^{-11}$	0.8	$8.1.10^{-11}$
		M	0.8	$3.0.10^{-11}$	$4.8.10^{-11}$		
ruthenium							
Ru-94	51.8 min	F	0.05	$2.7.10^{-11}$	$4.9.10^{-11}$	0.05	$9.4.10^{-11}$
		M	0.05	$4.4.10^{-11}$	$7.2.10^{-11}$		
		S	0.05	$4.6.10^{-11}$	$7.4.10^{-11}$		
Ru-97	2.9 d	F	0.05	$6.7.10^{-11}$	$1.2.10^{-10}$	0.05	$1.5.10^{-10}$
		M	0.05	$1.1.10^{-10}$	$1.6.10^{-10}$		
		S	0.05	$1.1.10^{-10}$	$1.6.10^{-10}$		
Ru-103	39.28 d	F	0.05	$4.9.10^{-10}$	$6.8.10^{-10}$	0.05	$7.3.10^{-10}$
		M	0.05	$2.3.10^{-9}$	$1.9.10^{-9}$		
		S	0.05	$2.8.10^{-9}$	$2.2.10^{-9}$		
Ru-105	4.44 h	F	0.05	$7.1.10^{-11}$	$1.3.10^{-10}$	0.05	$2.6.10^{-10}$
		M	0.05	$1.7.10^{-10}$	$2.4.10^{-10}$		
		S	0.05	$1.8.10^{-10}$	$2.5.10^{-10}$		
Ru-106	368.2 d	F	0.05	$8.0.10^{-9}$	$9.8.10^{-9}$	0.05	$7.0.10^{-9}$
		M	0.05	$2.6.10^{-8}$	$1.7.10^{-8}$		
		S	0.05	$6.2.10^{-8}$	$3.5.10^{-8}$		
rhodium							
Rh-99	16 d	F	0.05	$3.3.10^{-10}$	$4.9.10^{-10}$	0.05	$5.1.10^{-10}$
		M	0.05	$7.3.10^{-10}$	$8.2.10^{-10}$		
		S	0.05	$8.3.10^{-10}$	$8.9.10^{-10}$		
Rh-99m	4.7 h	F	0.05	$3.0.10^{-11}$	$5.7.10^{-11}$	0.05	$6.6.10^{-11}$
		M	0.05	$4.1.10^{-11}$	$7.2.10^{-11}$		
		S	0.05	$4.3.10^{-11}$	$7.3.10^{-11}$		
Rh-100	2.08 h	F	0.05	$2.8.10^{-10}$	$5.1.10^{-10}$	0.05	$7.1.10^{-10}$
		M	0.05	$3.6.10^{-10}$	$6.2.10^{-10}$		
		S	0.05	$3.7.10^{-10}$	$6.3.10^{-10}$		
Rh-101	3.2 y	F	0.05	$1.4.10^{-9}$	$1.7.10^{-9}$	0.05	$5.5.10^{-10}$
		M	0.05	$2.2.10^{-9}$	$1.7.10^{-9}$		

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		S	0.05	$5.0.10^{-9}$	$3.1.10^{-9}$		
Rh-101m	4.34 d	F	0.05	$1.0.10^{-10}$	$1.7.10^{-10}$	0.05	$2.2.10^{-10}$
		M	0.05	$2.0.10^{-10}$	$2.5.10^{-10}$		
		S	0.05	$2.1.10^{-10}$	$2.7.10^{-10}$		
Rh-102m	2.9 y	F	0.05	$7.3.10^{-9}$	$8.9.10^{-9}$	0.05	$2.6.10^{-9}$
		M	0.05	$6.5.10^{-9}$	$5.0.10^{-9}$		
		S	0.05	$1.6.10^{-8}$	$9.0.10^{-9}$		
Rh-102	207 d	F	0.05	$1.5.10^{-9}$	$1.9.10^{-9}$	0.05	$1.2.10^{-9}$
		M	0.05	$3.8.10^{-9}$	$2.7.10^{-9}$		
		S	0.05	$6.7.10^{-9}$	$4.2.10^{-9}$		
Rh-103m	56.12 min	F	0.05	$8.6.10^{-13}$	$1.2.10^{-12}$	0.05	$3.8.10^{-12}$
		M	0.05	$2.3.10^{-12}$	$2.4.10^{-12}$		
		S	0.05	$2.5.10^{-12}$	$2.5.10^{-12}$		
Rh-105	35.36 h	F	0.05	$8.7.10^{-11}$	$1.5.10^{-10}$	0.05	$3.7.10^{-10}$
		M	0.05	$3.1.10^{-10}$	$4.1.10^{-10}$		
		S	0.05	$3.4.10^{-10}$	$4.4.10^{-10}$		
Rh-106m	132 min	F	0.05	$7.0.10^{-11}$	$1.3.10^{-10}$	0.05	$1.6.10^{-10}$
		M	0.05	$1.1.10^{-10}$	$1.8.10^{-10}$		
		S	0.05	$1.2.10^{-10}$	$1.9.10^{-10}$		
Rh-107	21.7 min	F	0.05	$9.6.10^{-12}$	$1.6.10^{-11}$	0.05	$2.4.10^{-11}$
		M	0.05	$1.7.10^{-11}$	$2.7.10^{-11}$		
		S	0.05	$1.7.10^{-11}$	$2.8.10^{-11}$		
palladium							
Pd-100	3.63 d	F	0.005	$4.9.10^{-10}$	$7.6.10^{-10}$	0.005	$9.4.10^{-10}$
		M	0.005	$7.9.10^{-10}$	$9.5.10^{-10}$		
		S	0.005	$8.3.10^{-10}$	$9.7.10^{-10}$		
Pd-101	8.27 h	F	0.005	$4.2.10^{-11}$	$7.5.10^{-11}$	0.005	$9.4.10^{-11}$
		M	0.005	$6.2.10^{-11}$	$9.8.10^{-11}$		
		S	0.005	$6.4.10^{-11}$	$1.0.10^{-10}$		
Pd-103	16.96 d	F	0.005	$9.0.10^{-11}$	$1.2.10^{-10}$	0.005	$1.9.10^{-10}$
		M	0.005	$3.5.10^{-10}$	$3.0.10^{-10}$		
		S	0.005	$4.0.10^{-10}$	$2.9.10^{-10}$		
Pd-107	6.5×10^6 y	F	0.005	$2.6.10^{-11}$	$3.3.10^{-11}$	0.005	$3.7.10^{-11}$
		M	0.005	$8.0.10^{-11}$	$5.2.10^{-11}$		
		S	0.005	$5.5.10^{-10}$	$2.9.10^{-10}$		

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
Pd-109	13.427 h	F	0.005	$1.2.10^{-10}$	$2.1.10^{-10}$	0.005	$5.5.10^{-10}$
		M	0.005	$3.4.10^{-10}$	$4.7.10^{-10}$		
		S	0.005	$3.6.10^{-10}$	$5.0.10^{-10}$		
silver							
Ag-102	12.9 min	F	0.05	$1.4.10^{-11}$	$2.4.10^{-11}$	0.05	$4.0.10^{-11}$
		M	0.05	$1.8.10^{-11}$	$3.2.10^{-11}$		
		S	0.05	$1.9.10^{-11}$	$3.2.10^{-11}$		
Ag-103	65.7 min	F	0.05	$1.6.10^{-11}$	$2.8.10^{-11}$	0.05	$4.3.10^{-11}$
		M	0.05	$2.7.10^{-11}$	$4.3.10^{-11}$		
		S	0.05	$2.8.10^{-11}$	$4.5.10^{-11}$		
Ag-104	69.2 min	F	0.05	$3.0.10^{-11}$	$5.7.10^{-11}$	0.05	$6.0.10^{-11}$
		M	0.05	$3.9.10^{-11}$	$6.9.10^{-11}$		
		S	0.05	$4.0.10^{-11}$	$7.1.10^{-11}$		
Ag-104m	33.5 min	F	0.05	$1.7.10^{-11}$	$3.1.10^{-11}$	0.05	$5.4.10^{-11}$
		M	0.05	$2.6.10^{-11}$	$4.4.10^{-11}$		
		S	0.05	$2.7.10^{-11}$	$4.5.10^{-11}$		
Ag-105	41.0 d	F	0.05	$5.4.10^{-10}$	$8.0.10^{-10}$	0.05	$4.7.10^{-10}$
		M	0.05	$6.9.10^{-10}$	$7.0.10^{-10}$		
		S	0.05	$7.8.10^{-10}$	$7.3.10^{-10}$		
Ag-106	23.96 min	F	0.05	$9.8.10^{-12}$	$1.7.10^{-11}$	0.05	$3.2.10^{-11}$
		M	0.05	$1.6.10^{-11}$	$2.6.10^{-11}$		
		S	0.05	$1.6.10^{-11}$	$2.7.10^{-11}$		
Ag-106m	8.41 d	F	0.05	$1.1.10^{-9}$	$1.6.10^{-9}$	0.05	$1.5.10^{-9}$
		M	0.05	$1.1.10^{-9}$	$1.5.10^{-9}$		
		S	0.05	$1.1.10^{-9}$	$1.4.10^{-9}$		
Ag-108m	127 y	F	0.05	$6.1.10^{-9}$	$7.3.10^{-9}$	0.05	$2.3.10^{-9}$
		M	0.05	$7.0.10^{-9}$	$5.2.10^{-9}$		
		S	0.05	$3.5.10^{-8}$	$1.9.10^{-8}$		
Ag-110m	249.9 d	F	0.05	$5.5.10^{-9}$	$6.7.10^{-9}$	0.05	$2.8.10^{-9}$
		M	0.05	$7.2.10^{-9}$	$5.9.10^{-9}$		
		S	0.05	$1.2.10^{-8}$	$7.3.10^{-9}$		
Ag-111	7.45 d	F	0.05	$4.1.10^{-10}$	$5.7.10^{-10}$	0.05	$1.3.10^{-9}$
		M	0.05	$1.5.10^{-9}$	$1.5.10^{-9}$		
		S	0.05	$1.7.10^{-9}$	$1.6.10^{-9}$		
Ag-112	3.12 h	F	0.05	$8.2.10^{-11}$	$1.4.10^{-10}$	0.05	$4.3.10^{-10}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		M	0.05	$1.7.10^{-10}$	$2.5.10^{-10}$		
		S	0.05	$1.8.10^{-10}$	$2.6.10^{-10}$		
Ag-115	20.0 min	F	0.05	$1.6.10^{-11}$	$2.6.10^{-11}$	0.05	$6.0.10^{-11}$
		M	0.05	$2.8.10^{-11}$	$4.3.10^{-11}$		
		S	0.05	$3.0.10^{-11}$	$4.4.10^{-11}$		
cadmium							
Cd-104	57.7 min	F	0.05	$2.7.10^{-11}$	$5.0.10^{-11}$	0.05	$5.8.10^{-11}$
		M	0.05	$3.6.10^{-11}$	$6.2.10^{-11}$		
		S	0.05	$3.7.10^{-11}$	$6.3.10^{-11}$		
Cd-107	6.49 h	F	0.05	$2.3.10^{-11}$	$4.2.10^{-11}$	0.05	$6.2.10^{-11}$
		M	0.05	$8.1.10^{-11}$	$1.0.10^{-10}$		
		S	0.05	$8.7.10^{-11}$	$1.1.10^{-10}$		
Cd-109	464 d	F	0.05	$8.1.10^{-9}$	$9.6.10^{-9}$	0.05	$2.0.10^{-9}$
		M	0.05	$6.2.10^{-9}$	$5.1.10^{-9}$		
		S	0.05	$5.8.10^{-9}$	$4.4.10^{-9}$		
Cd-113	9.3×10^{15} y	F	0.05	$1.2.10^{-7}$	$1.4.10^{-7}$	0.05	$2.5.10^{-8}$
		M	0.05	$5.3.10^{-8}$	$4.3.10^{-8}$		
		S	0.05	$2.5.10^{-8}$	$2.1.10^{-8}$		
Cd-113m	13.6 y	F	0.05	$1.1.10^{-7}$	$1.3.10^{-7}$	0.05	$2.3.10^{-8}$
		M	0.05	$5.0.10^{-8}$	$4.0.10^{-8}$		
		S	0.05	$3.0.10^{-8}$	$2.4.10^{-8}$		
Cd-115	53.46 h	F	0.05	$3.7.10^{-10}$	$5.4.10^{-10}$	0.05	$1.4.10^{-9}$
		M	0.05	$9.7.10^{-10}$	$1.2.10^{-9}$		
		S	0.05	$1.1.10^{-9}$	$1.3.10^{-9}$		
Cd-115m	44.6 d	F	0.05	$5.3.10^{-9}$	$6.4.10^{-9}$	0.05	$3.3.10^{-9}$
		M	0.05	$5.9.10^{-9}$	$5.5.10^{-9}$		
		S	0.05	$7.3.10^{-9}$	$5.5.10^{-9}$		
Cd-117	2.49 h	F	0.05	$7.3.10^{-11}$	$1.3.10^{-10}$	0.05	$2.8.10^{-10}$
		M	0.05	$1.6.10^{-10}$	$2.4.10^{-10}$		
		S	0.05	$1.7.10^{-10}$	$2.5.10^{-10}$		
Cd-117m	3.36 h	F	0.05	$1.0.10^{-10}$	$1.9.10^{-10}$	0.05	$2.8.10^{-10}$
		M	0.05	$2.0.10^{-10}$	$3.1.10^{-10}$		
		S	0.05	$2.1.10^{-10}$	$3.2.10^{-10}$		
indium							
In-109	4.2 h	F	0.02	$3.2.10^{-11}$	$5.7.10^{-11}$	0.02	$6.6.10^{-11}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		M	0.02	$4.4.10^{-11}$	$7.3.10^{-11}$		
In-110	4.9 h	F	0.02	$1.2.10^{-10}$	$2.2.10^{-10}$	0.02	$2.4.10^{-10}$
		M	0.02	$1.4.10^{-10}$	$2.5.10^{-10}$		
In-110m	69.1 min	F	0.02	$3.1.10^{-11}$	$5.5.10^{-11}$	0.02	$1.0.10^{-10}$
		M	0.02	$5.0.10^{-11}$	$8.1.10^{-11}$		
In-111	2.83 d	F	0.02	$1.3.10^{-10}$	$2.2.10^{-10}$	0.02	$2.9.10^{-10}$
		M	0.02	$2.3.10^{-10}$	$3.1.10^{-10}$		
In-112	14.4 min	F	0.02	$5.0.10^{-12}$	$8.6.10^{-12}$	0.02	$1.0.10^{-11}$
		M	0.02	$7.8.10^{-12}$	$1.3.10^{-11}$		
In-113m	1.658 h	F	0.02	$1.0.10^{-11}$	$1.9.10^{-11}$	0.02	$2.8.10^{-11}$
		M	0.02	$2.0.10^{-11}$	$3.2.10^{-11}$		
In-114m	49.51 d	F	0.02	$9.3.10^{-9}$	$1.1.10^{-8}$	0.02	$4.1.10^{-9}$
		M	0.02	$5.9.10^{-9}$	$5.9.10^{-9}$		
In-115	5.1 x 10^{15} y	F	0.02	$3.9.10^{-7}$	$4.5.10^{-7}$	0.02	$3.2.10^{-8}$
		M	0.02	$1.5.10^{-7}$	$1.1.10^{-7}$		
In-115m	4.486 h	F	0.02	$2.5.10^{-11}$	$4.5.10^{-11}$	0.02	$8.6.10^{-11}$
		M	0.02	$6.0.10^{-11}$	$8.7.10^{-11}$		
In-116m	54.15 min	F	0.02	$3.0.10^{-11}$	$5.5.10^{-11}$	0.02	$6.4.10^{-11}$
		M	0.02	$4.8.10^{-11}$	$8.0.10^{-11}$		
In-117	43.8 min	F	0.02	$1.6.10^{-11}$	$2.8.10^{-11}$	0.02	$3.1.10^{-11}$
		M	0.02	$3.0.10^{-11}$	$4.8.10^{-11}$		
In-117m	116.5 min	F	0.02	$3.1.10^{-11}$	$5.5.10^{-11}$	0.02	$1.2.10^{-10}$
		M	0.02	$7.3.10^{-11}$	$1.1.10^{-10}$		
In-119m	18.0 min	F	0.02	$1.1.10^{-11}$	$1.8.10^{-11}$	0.02	$4.7.10^{-11}$
		M	0.02	$1.8.10^{-11}$	$2.9.10^{-11}$		
tin							
Sn-110	4.0 h	F	0.02	$1.1.10^{-10}$	$1.9.10^{-10}$	0.02	$3.5.10^{-10}$
		M	0.02	$1.6.10^{-10}$	$2.6.10^{-10}$		
Sn-111	35.3 min	F	0.02	$8.3.10^{-12}$	$1.5.10^{-11}$	0.02	$2.3.10^{-11}$
		M	0.02	$1.4.10^{-11}$	$2.2.10^{-11}$		
Sn-113	115.1 d	F	0.02	$5.4.10^{-10}$	$7.9.10^{-10}$	0.02	$7.3.10^{-10}$
		M	0.02	$2.5.10^{-9}$	$1.9.10^{-9}$		
Sn-117m	13.61 d	F	0.02	$2.9.10^{-10}$	$3.9.10^{-10}$	0.02	$7.1.10^{-10}$
		M	0.02	$2.3.10^{-9}$	$2.2.10^{-9}$		
Sn-119m	293.0 d	F	0.02	$2.9.10^{-10}$	$3.6.10^{-10}$	0.02	$3.4.10^{-10}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		M	0.02	$2.0.10^{-9}$	$1.5.10^{-9}$		
Sn-121	27.06 h	F	0.02	$6.4.10^{-11}$	$1.0.10^{-10}$	0.02	$2.3.10^{-10}$
		M	0.02	$2.2.10^{-10}$	$2.8.10^{-10}$		
Sn-121m	55 y	F	0.02	$8.0.10^{-10}$	$9.7.10^{-10}$	0.02	$3.8.10^{-10}$
		M	0.02	$4.2.10^{-9}$	$3.3.10^{-9}$		
Sn-123	129.2 d	F	0.02	$1.2.10^{-9}$	$1.6.10^{-9}$	0.02	$2.1.10^{-9}$
		M	0.02	$7.7.10^{-9}$	$5.6.10^{-9}$		
Sn-123m	40.08 min	F	0.02	$1.4.10^{-11}$	$2.4.10^{-11}$	0.02	$3.8.10^{-11}$
		M	0.02	$2.8.10^{-11}$	$4.4.10^{-11}$		
Sn-125	9.64 d	F	0.02	$9.2.10^{-10}$	$1.3.10^{-9}$	0.02	$3.1.10^{-9}$
		M	0.02	$3.0.10^{-9}$	$2.8.10^{-9}$		
Sn-126	1.0×10^5 y	F	0.02	$1.1.10^{-8}$	$1.4.10^{-8}$	0.02	$4.7.10^{-9}$
		M	0.02	$2.7.10^{-8}$	$1.8.10^{-8}$		
Sn-127	2.10 h	F	0.02	$6.9.10^{-11}$	$1.2.10^{-10}$	0.02	$2.0.10^{-10}$
		M	0.02	$1.3.10^{-10}$	$2.0.10^{-10}$		
Sn-128	59.1 min	F	0.02	$5.4.10^{-11}$	$9.5.10^{-11}$	0.02	$1.5.10^{-10}$
		M	0.02	$9.6.10^{-11}$	$1.5.10^{-10}$		
antimony							
Sb-115	31.8 min	F	0.1	$9.2.10^{-12}$	$1.7.10^{-11}$	0.1	$2.4.10^{-11}$
		M	0.01	$1.4.10^{-11}$	$2.3.10^{-11}$		
Sb-116	15.8 min	F	0.1	$9.9.10^{-12}$	$1.8.10^{-11}$	0.1	$2.6.10^{-11}$
		M	0.01	$1.4.10^{-11}$	$2.3.10^{-11}$		
Sb-116m	60.3 min	F	0.1	$3.5.10^{-11}$	$6.4.10^{-11}$	0.1	$6.7.10^{-11}$
		M	0.01	$5.0.10^{-11}$	$8.5.10^{-11}$		
Sb-117	2.80 h	F	0.1	$9.3.10^{-12}$	$1.7.10^{-11}$	0.1	$1.8.10^{-11}$
		M	0.01	$1.7.10^{-11}$	$2.7.10^{-11}$		
Sb-118m	5.00 h	F	0.1	$1.0.10^{-10}$	$1.9.10^{-10}$	0.1	$2.1.10^{-10}$
		M	0.01	$1.3.10^{-10}$	$2.3.10^{-10}$		
Sb-119	38.1 h	F	0.1	$2.5.10^{-11}$	$4.5.10^{-11}$	0.1	$8.1.10^{-11}$
		M	0.01	$3.7.10^{-11}$	$5.9.10^{-11}$		
Sb-120m	5.76 d	F	0.1	$5.9.10^{-10}$	$9.8.10^{-10}$	0.1	$1.2.10^{-9}$
		M	0.01	$1.0.10^{-9}$	$1.3.10^{-9}$		
Sb-120	15.89 min	F	0.1	$4.9.10^{-12}$	$8.5.10^{-12}$	0.1	$1.4.10^{-11}$
		M	0.01	$7.4.10^{-12}$	$1.2.10^{-11}$		
Sb-122	2.70 d	F	0.1	$3.9.10^{-10}$	$6.3.10^{-10}$	0.1	$1.7.10^{-9}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		M	0.01	$1.0.10^{-9}$	$1.2.10^{-9}$		
Sb-124	60.20 d	F	0.1	$1.3.10^{-9}$	$1.9.10^{-9}$	0.1	$2.5.10^{-9}$
		M	0.01	$6.1.10^{-9}$	$4.7.10^{-9}$		
Sb-124m	20.2 min	F	0.1	$3.0.10^{-12}$	$5.3.10^{-12}$	0.1	$8.0.10^{-12}$
		M	0.01	$5.5.10^{-12}$	$8.3.10^{-12}$		
Sb-125	2.77 y	F	0.1	$1.4.10^{-9}$	$1.7.10^{-9}$	0.1	$1.1.10^{-9}$
		M	0.01	$4.5.10^{-9}$	$3.3.10^{-9}$		
Sb-126	12.4 d	F	0.1	$1.1.10^{-9}$	$1.7.10^{-9}$	0.1	$2.4.10^{-9}$
		M	0.01	$2.7.10^{-9}$	$3.2.10^{-9}$		
Sb-126m	19.0 min	F	0.1	$1.3.10^{-11}$	$2.3.10^{-11}$	0.1	$3.6.10^{-11}$
		M	0.01	$2.0.10^{-11}$	$3.3.10^{-11}$		
Sb-127	3.85 d	F	0.1	$4.6.10^{-10}$	$7.4.10^{-10}$	0.1	$1.7.10^{-9}$
		M	0.01	$1.6.10^{-9}$	$1.7.10^{-9}$		
Sb-128	9.01 h	F	0.1	$2.5.10^{-10}$	$4.6.10^{-10}$	0.1	$7.6.10^{-10}$
		M	0.01	$4.2.10^{-10}$	$6.7.10^{-10}$		
Sb-128m	10.4 min	F	0.1	$1.1.10^{-11}$	$1.9.10^{-11}$	0.1	$3.3.10^{-11}$
		M	0.01	$1.5.10^{-11}$	$2.6.10^{-11}$		
Sb-129	4.32 h	F	0.1	$1.1.10^{-10}$	$2.0.10^{-10}$	0.1	$4.2.10^{-10}$
		M	0.01	$2.4.10^{-10}$	$3.5.10^{-10}$		
Sb-130	40 min	F	0.1	$3.5.10^{-11}$	$6.3.10^{-11}$	0.1	$9.1.10^{-11}$
		M	0.01	$5.4.10^{-11}$	$9.1.10^{-11}$		
Sb-131	23 min	F	0.1	$3.7.10^{-11}$	$5.9.10^{-11}$	0.1	$1.0.10^{-10}$
		M	0.01	$5.2.10^{-11}$	$8.3.10^{-11}$		
tellurium							
Te-116	2.49 h	F	0.3	$6.3.10^{-11}$	$1.2.10^{-10}$	0.3	$1.7.10^{-10}$
		M	0.3	$1.1.10^{-10}$	$1.7.10^{-10}$		
Te-121	17 d	F	0.3	$2.5.10^{-10}$	$3.9.10^{-10}$	0.3	$4.3.10^{-10}$
		M	0.3	$3.9.10^{-10}$	$4.4.10^{-10}$		
Te-121m	154 d	F	0.3	$1.8.10^{-9}$	$2.3.10^{-9}$	0.3	$2.3.10^{-9}$
		M	0.3	$4.2.10^{-9}$	$3.6.10^{-9}$		
Te-123	1 x 10^{13} y	F	0.3	$4.0.10^{-9}$	$5.0.10^{-9}$	0.3	$4.4.10^{-9}$
		M	0.3	$2.6.10^{-9}$	$2.8.10^{-9}$		
Te-123m	119.7 d	F	0.3	$9.7.10^{-10}$	$1.2.10^{-9}$	0.3	$1.4.10^{-9}$
		M	0.3	$3.9.10^{-9}$	$3.4.10^{-9}$		
Te-125m	58 d	F	0.3	$5.1.10^{-10}$	$6.7.10^{-10}$	0.3	$8.7.10^{-10}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		M	0.3	$3.3.10^{-9}$	$2.9.10^{-9}$		
Te-127	9.35 h	F	0.3	$4.2.10^{-11}$	$7.2.10^{-11}$	0.3	$1.7.10^{-10}$
		M	0.3	$1.2.10^{-10}$	$1.8.10^{-10}$		
Te-127m	109 d	F	0.3	$1.6.10^{-9}$	$2.0.10^{-9}$	0.3	$2.3.10^{-9}$
		M	0.3	$7.2.10^{-9}$	$6.2.10^{-9}$		
Te-129	69.6 min	F	0.3	$1.7.10^{-11}$	$2.9.10^{-11}$	0.3	$6.3.10^{-11}$
		M	0.3	$3.8.10^{-11}$	$5.7.10^{-11}$		
Te-129m	33.6 d	F	0.3	$1.3.10^{-9}$	$1.8.10^{-9}$	0.3	$3.0.10^{-9}$
		M	0.3	$6.3.10^{-9}$	$5.4.10^{-9}$		
Te-131	25.0 min	F	0.3	$2.3.10^{-11}$	$4.6.10^{-11}$	0.3	$8.7.10^{-11}$
		M	0.3	$3.8.10^{-11}$	$6.1.10^{-11}$		
Te-131m	30 h	F	0.3	$8.7.10^{-10}$	$1.2.10^{-9}$	0.3	$1.9.10^{-9}$
		M	0.3	$1.1.10^{-9}$	$1.6.10^{-9}$		
Te-132	78.2 h	F	0.3	$1.8.10^{-9}$	$2.4.10^{-9}$	0.3	$3.7.10^{-9}$
		M	0.3	$2.2.10^{-9}$	$3.0.10^{-9}$		
Te-133	12.45 min	F	0.3	$2.0.10^{-11}$	$3.8.10^{-11}$	0.3	$7.2.10^{-11}$
		M	0.3	$2.7.10^{-11}$	$4.4.10^{-11}$		
Te-133m	55.4 min	F	0.3	$8.4.10^{-11}$	$1.2.10^{-10}$	0.3	$2.8.10^{-10}$
		M	0.3	$1.2.10^{-10}$	$1.9.10^{-10}$		
Te-134	41.8 min	F	0.3	$5.0.10^{-11}$	$8.3.10^{-11}$	0.3	$1.1.10^{-10}$
		M	0.3	$7.1.10^{-11}$	$1.1.10^{-10}$		
iodine							
I-120	81.0 min	F	1	$1.0.10^{-10}$	$1.9.10^{-10}$	1	$3.4.10^{-10}$
I-120m	53 min	F	1	$8.7.10^{-11}$	$1.4.10^{-10}$	1	$2.1.10^{-10}$
I-121	2.12 h	F	1	$2.8.10^{-11}$	$3.9.10^{-11}$	1	$8.2.10^{-11}$
I-123	13.2 h	F	1	$7.6.10^{-11}$	$1.1.10^{-10}$	1	$2.1.10^{-10}$
I-124	4.18 d	F	1	$4.5.10^{-9}$	$6.3.10^{-9}$	1	$1.3.10^{-8}$
I-125	60.14 d	F	1	$5.3.10^{-9}$	$7.3.10^{-9}$	1	$1.5.10^{-8}$
I-126	13.02 d	F	1	$1.0.10^{-8}$	$1.4.10^{-8}$	1	$2.9.10^{-8}$
I-128	24.99 min	F	1	$1.4.10^{-11}$	$2.2.10^{-11}$	1	$4.6.10^{-11}$
I-129	1.57×10^7 y	F	1	$3.7.10^{-8}$	$5.1.10^{-8}$	1	$1.1.10^{-7}$
I-130	12.36 h	F	1	$6.9.10^{-10}$	$9.6.10^{-10}$	1	$2.0.10^{-9}$
I-131	8.04 d	F	1	$7.6.10^{-9}$	$1.1.10^{-8}$	1	$2.2.10^{-8}$
I-132	2.30 h	F	1	$9.6.10^{-11}$	$2.0.10^{-10}$	1	$2.9.10^{-10}$
I-132m	83.6 min	F	1	$8.1.10^{-11}$	$1.1.10^{-10}$	1	$2.2.10^{-10}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq]		f_1	h_{ing} [Sv/Bq]
				d_{ama} = 1 µm	d_{ama} = 5 µm		
I-133	2.08 h	F	1	$1.5.10^{-9}$	$2.1.10^{-9}$	1	$4.3.10^{-9}$
I-134	52.6 min	F	1	$4.8.10^{-11}$	$7.9.10^{-11}$	1	$1.1.10^{-10}$
I-135	6.61 h	F	1	$3.3.10^{-10}$	$4.6.10^{-10}$	1	$9.3.10^{-10}$
caesium							
Cs-125	45 min	F	1	$1.3.10^{-11}$	$2.3.10^{-11}$	1	$3.5.10^{-11}$
Cs-127	6.25 h	F	1	$2.2.10^{-11}$	$4.0.10^{-11}$	1	$2.4.10^{-11}$
Cs-129	32.06 h	F	1	$4.5.10^{-11}$	$8.1.10^{-11}$	1	$6.0.10^{-11}$
Cs-130	29.9 min	F	1	$8.4.10^{-12}$	$1.5.10^{-11}$	1	$2.8.10^{-11}$
Cs-131	9.69 d	F	1	$2.8.10^{-11}$	$4.5.10^{-11}$	1	$5.8.10^{-11}$
Cs-132	6.475 d	F	1	$2.4.10^{-10}$	$3.8.10^{-10}$	1	$5.0.10^{-10}$
Cs-134	2.062 y	F	1	$6.8.10^{-9}$	$9.6.10^{-9}$	1	$1.9.10^{-8}$
Cs-134m	2.90 h	F	1	$1.5.10^{-11}$	$2.6.10^{-11}$	1	$2.0.10^{-11}$
Cs-135	2.3×10^{6} y	F	1	$7.1.10^{-10}$	$9.9.10^{-10}$	1	$2.0.10^{-9}$
Cs-135m	53 min	F	1	$1.3.10^{-11}$	$2.4.10^{-11}$	1	$1.9.10^{-11}$
Cs-136	13.1 d	F	1	$1.3.10^{-9}$	$1.9.10^{-9}$	1	$3.0.10^{-9}$
Cs-137	30.0 y	F	1	$4.8.10^{-9}$	$6.7.10^{-9}$	1	$1.3.10^{-8}$
Cs-138	32.2 min	F	1	$2.6.10^{-11}$	$4.6.10^{-11}$	1	$9.2.10^{-11}$
barium							
Ba-126	96.5 min	F	0.1	$7.8.10^{-11}$	$1.2.10^{-10}$	0.1	$2.6.10^{-10}$
Ba-128	2.43 d	F	0.1	$8.0.10^{-10}$	$1.3.10^{-9}$	0.1	$2.7.10^{-9}$
Ba-131	11.8 d	F	0.1	$2.3.10^{-10}$	$3.5.10^{-10}$	0.1	$4.5.10^{-10}$
Ba-131m	14.6 min	F	0.1	$4.1.10^{-12}$	$6.4.10^{-12}$	0.1	$4.9.10^{-12}$
Ba-133	10.74 y	F	0.1	$1.5.10^{-9}$	$1.8.10^{-9}$	0.1	$1.0.10^{-9}$
Ba-133m	38.9 h	F	0.1	$1.9.10^{-10}$	$2.8.10^{-10}$	0.1	$5.5.10^{-10}$
Ba-135m	28.7 h	F	0.1	$1.5.10^{-10}$	$2.3.10^{-10}$	0.1	$4.5.10^{-10}$
Ba-139	82.7 min	F	0.1	$3.5.10^{-11}$	$5.5.10^{-11}$	0.1	$1.2.10^{-10}$
Ba-140	12.74 d	F	0.1	$1.0.10^{-9}$	$1.6.10^{-9}$	0.1	$2.5.10^{-9}$
Ba-141	18.27 min	F	0.1	$2.2.10^{-11}$	$3.5.10^{-11}$	0.1	$7.0.10^{-11}$
Ba-142	10.6 min	F	0.1	$1.6.10^{-11}$	$2.7.10^{-11}$	0.1	$3.5.10^{-11}$
lanthanum							
La-131	59 min	F	$5.0.10^{-4}$	$1.4.10^{-11}$	$2.4.10^{-11}$	$5.0.10^{-4}$	$3.5.10^{-11}$
		M	$5.0.10^{-4}$	$2.3.10^{-11}$	$3.6.10^{-11}$		
La-132	4.8 h	F	$5.0.10^{-4}$	$1.1.10^{-10}$	$2.0.10^{-10}$	$5.0.10^{-4}$	$3.9.10^{-10}$
		M	$5.0.10^{-4}$	$1.7.10^{-10}$	$2.8.10^{-10}$		
La-135	19.5 h	F	$5.0.10^{-4}$	$1.1.10^{-11}$	$2.0.10^{-11}$	$5.0.10^{-4}$	$3.0.10^{-11}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		M	$5.0.10^{-4}$	$1.5.10^{-11}$	$2.5.10^{-11}$		
La-137	6×10^4 y	F	$5.0.10^{-4}$	$8.6.10^{-9}$	$1.0.10^{-8}$	$5.0.10^{-4}$	$8.1.10^{-11}$
		M	$5.0.10^{-4}$	$3.4.10^{-9}$	$2.3.10^{-9}$		
La-138	1.35×10^{11} y	F	$5.0.10^{-4}$	$1.5.10^{-7}$	$1.8.10^{-7}$	$5.0.10^{-4}$	$1.1.10^{-9}$
		M	$5.0.10^{-4}$	$6.1.10^{-8}$	$4.2.10^{-8}$		
La-140	40.272 h	F	$5.0.10^{-4}$	$6.0.10^{-10}$	$1.0.10^{-9}$	$5.0.10^{-4}$	$2.0.10^{-9}$
		M	$5.0.10^{-4}$	$1.1.10^{-9}$	$1.5.10^{-9}$		
La-141	3.93 h	F	$5.0.10^{-4}$	$6.7.10^{-11}$	$1.1.10^{-10}$	$5.0.10^{-4}$	$3.6.10^{-10}$
		M	$5.0.10^{-4}$	$1.5.10^{-10}$	$2.2.10^{-10}$		
La-142	92.5 min	F	$5.0.10^{-4}$	$5.6.10^{-11}$	$1.0.10^{-10}$	$5.0.10^{-4}$	$1.8.10^{-10}$
		M	$5.0.10^{-4}$	$9.3.10^{-11}$	$1.5.10^{-10}$		
La-143	14.23 min	F	$5.0.10^{-4}$	$1.2.10^{-11}$	$2.0.10^{-11}$	$5.0.10^{-4}$	$5.6.10^{-11}$
		M	$5.0.10^{-4}$	$2.2.10^{-11}$	$3.3.10^{-11}$		
cerium							
Ce-134	72.0 h	M	$5.0.10^{-4}$	$1.3.10^{-9}$	$1.5.10^{-9}$	$5.0.10^{-4}$	$2.5.10^{-9}$
		S	$5.0.10^{-4}$	$1.3.10^{-9}$	$1.6.10^{-9}$		
Ce-135	17.6 h	M	$5.0.10^{-4}$	$4.9.10^{-10}$	$7.3.10^{-10}$	$5.0.10^{-4}$	$7.9.10^{-10}$
		S	$5.0.10^{-4}$	$5.1.10^{-10}$	$7.6.10^{-10}$		
Ce-137	9.0 h	M	$5.0.10^{-4}$	$1.0.10^{-11}$	$1.8.10^{-11}$	$5.0.10^{-4}$	$2.5.10^{-11}$
		S	$5.0.10^{-4}$	$1.1.10^{-11}$	$1.9.10^{-11}$		
Ce-137m	34.4 h	M	$5.0.10^{-4}$	$4.0.10^{-10}$	$5.5.10^{-10}$	$5.0.10^{-4}$	$5.4.10^{-10}$
		S	$5.0.10^{-4}$	$4.3.10^{-10}$	$5.9.10^{-10}$		
Ce-139	137.66 d	M	$5.0.10^{-4}$	$1.6.10^{-9}$	$1.3.10^{-9}$	$5.0.10^{-4}$	$2.6.10^{-10}$
		S	$5.0.10^{-4}$	$1.8.10^{-9}$	$1.4.10^{-9}$		
Ce-141	32.501 d	M	$5.0.10^{-4}$	$3.1.10^{-9}$	$2.7.10^{-9}$	$5.0.10^{-4}$	$7.1.10^{-10}$
		S	$5.0.10^{-4}$	$3.6.10^{-9}$	$3.1.10^{-9}$		
Ce-143	33.0 h	M	$5.0.10^{-4}$	$7.4.10^{-10}$	$9.5.10^{-10}$	$5.0.10^{-4}$	$1.1.10^{-9}$
		S	$5.0.10^{-4}$	$8.1.10^{-10}$	$1.0.10^{-9}$		
Ce-144	284.3 d	M	$5.0.10^{-4}$	$3.4.10^{-8}$	$2.3.10^{-8}$	$5.0.10^{-4}$	$5.2.10^{-9}$
		S	$5.0.10^{-4}$	$4.9.10^{-8}$	$2.9.10^{-8}$		
praseodymium							
Pr-136	13.1 min	M	$5.0.10^{-4}$	$1.4.10^{-11}$	$2.4.10^{-11}$	$5.0.10^{-4}$	$3.3.10^{-11}$
		S	$5.0.10^{-4}$	$1.5.10^{-11}$	$2.5.10^{-11}$		
Pr-137	76.6 min	M	$5.0.10^{-4}$	$2.1.10^{-11}$	$3.4.10^{-11}$	$5.0.10^{-4}$	$4.0.10^{-11}$
		S	$5.0.10^{-4}$	$2.2.10^{-11}$	$3.5.10^{-11}$		

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
Pr-138m	2.1 h	M	$5.0.10^{-4}$	$7.6.10^{-11}$	$1.3.10^{-10}$	$5.0.10^{-4}$	$1.3.10^{-10}$
		S	$5.0.10^{-4}$	$7.9.10^{-11}$	$1.3.10^{-10}$		
Pr-139	4.51 h	M	$5.0.10^{-4}$	$1.9.10^{-11}$	$2.9.10^{-11}$	$5.0.10^{-4}$	$3.1.10^{-11}$
		S	$5.0.10^{-4}$	$2.0.10^{-11}$	$3.0.10^{-11}$		
Pr-142	19.13 h	M	$5.0.10^{-4}$	$5.3.10^{-10}$	$7.0.10^{-10}$	$5.0.10^{-4}$	$1.3.10^{-9}$
		S	$5.0.10^{-4}$	$5.6.10^{-10}$	$7.4.10^{-10}$		
Pr-142m	14.6 min	M	$5.0.10^{-4}$	$6.7.10^{-12}$	$8.9.10^{-12}$	$5.0.10^{-4}$	$1.7.10^{-11}$
		S	$5.0.10^{-4}$	$7.1.10^{-12}$	$9.4.10^{-12}$		
Pr-143	13.56 d	M	$5.0.10^{-4}$	$2.1.10^{-9}$	$1.9.10^{-9}$	$5.0.10^{-4}$	$1.2.10^{-9}$
		S	$5.0.10^{-4}$	$2.3.10^{-9}$	$2.2.10^{-9}$		
Pr-144	17.28 min	M	$5.0.10^{-4}$	$1.8.10^{-11}$	$2.9.10^{-11}$	$5.0.10^{-4}$	$5.0.10^{-11}$
		S	$5.0.10^{-4}$	$1.9.10^{-11}$	$3.0.10^{-11}$		
Pr-145	5.98 h	M	$5.0.10^{-4}$	$1.6.10^{-10}$	$2.5.10^{-10}$	$5.0.10^{-4}$	$3.9.10^{-10}$
		S	$5.0.10^{-4}$	$1.7.10^{-10}$	$2.6.10^{-10}$		
Pr-147	13.6 min	M	$5.0.10^{-4}$	$1.8.10^{-11}$	$2.9.10^{-11}$	$5.0.10^{-4}$	$3.3.10^{-11}$
		S	$5.0.10^{-4}$	$1.9.10^{-11}$	$3.0.10^{-11}$		
neodymium							
Nd-136	50.65 min	M	$5.0.10^{-4}$	$5.3.10^{-11}$	$8.5.10^{-11}$	$5.0.10^{-4}$	$9.9.10^{-11}$
		S	$5.0.10^{-4}$	$5.6.10^{-11}$	$8.9.10^{-11}$		
Nd-138	5.04 h	M	$5.0.10^{-4}$	$2.4.10^{-10}$	$3.7.10^{-10}$	$5.0.10^{-4}$	$6.4.10^{-10}$
		S	$5.0.10^{-4}$	$2.6.10^{-10}$	$3.8.10^{-10}$		
Nd-139	29.7 min	M	$5.0.10^{-4}$	$1.0.10^{-11}$	$1.7.10^{-11}$	$5.0.10^{-4}$	$2.0.10^{-11}$
		S	$5.0.10^{-4}$	$1.1.10^{-11}$	$1.7.10^{-11}$		
Nd-139m	5.5 h	M	$5.0.10^{-4}$	$1.5.10^{-10}$	$2.5.10^{-10}$	$5.0.10^{-4}$	$2.5.10^{-10}$
		S	$5.0.10^{-4}$	$1.6.10^{-10}$	$2.5.10^{-10}$		
Nd-141	2.49 h	M	$5.0.10^{-4}$	$5.1.10^{-12}$	$8.5.10^{-12}$	$5.0.10^{-4}$	$8.3.10^{-12}$
		S	$5.0.10^{-4}$	$5.3.10^{-12}$	$8.8.10^{-12}$		
Nd-147	10.98 d	M	$5.0.10^{-4}$	$2.0.10^{-9}$	$1.9.10^{-9}$	$5.0.10^{-4}$	$1.1.10^{-9}$
		S	$5.0.10^{-4}$	$2.3.10^{-9}$	$2.1.10^{-9}$		
Nd-149	1.73 h	M	$5.0.10^{-4}$	$8.5.10^{-11}$	$1.2.10^{-10}$	$5.0.10^{-4}$	$1.2.10^{-10}$
		S	$5.0.10^{-4}$	$9.0.10^{-11}$	$1.3.10^{-10}$		
Nd-151	12.44 min	M	$5.0.10^{-4}$	$1.7.10^{-11}$	$2.8.10^{-11}$	$5.0.10^{-4}$	$3.0.10^{-11}$
		S	$5.0.10^{-4}$	$1.8.10^{-11}$	$2.9.10^{-11}$		
promethium							
Pm-141	20.90 min	M	$5.0.10^{-4}$	$1.5.10^{-11}$	$2.4.10^{-11}$	$5.0.10^{-4}$	$3.6.10^{-11}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		S	$5.0.10^{-4}$	$1.6.10^{-11}$	$2.5.10^{-11}$		
Pm-143	265 d	M	$5.0.10^{-4}$	$1.4.10^{-9}$	$9.6.10^{-10}$	$5.0.10^{-4}$	$2.3.10^{-10}$
		S	$5.0.10^{-4}$	$1.3.10^{-9}$	$8.3.10^{-10}$		
Pm-144	363 d	M	$5.0.10^{-4}$	$7.8.10^{-9}$	$5.4.10^{-9}$	$5.0.10^{-4}$	$9.7.10^{-10}$
		S	$5.0.10^{-4}$	$7.0.10^{-9}$	$3.9.10^{-9}$		
Pm-145	17.7 y	M	$5.0.10^{-4}$	$3.4.10^{-9}$	$2.4.10^{-9}$	$5.0.10^{-4}$	$1.1.10^{-10}$
		S	$5.0.10^{-4}$	$2.1.10^{-9}$	$1.2.10^{-9}$		
Pm-146	2020 d	M	$5.0.10^{-4}$	$1.9.10^{-8}$	$1.3.10^{-8}$	$5.0.10^{-4}$	$9.0.10^{-10}$
		S	$5.0.10^{-4}$	$1.6.10^{-8}$	$9.0.10^{-9}$		
Pm-147	2.6234 y	M	$5.0.10^{-4}$	$4.7.10^{-9}$	$3.5.10^{-9}$	$5.0.10^{-4}$	$2.6.10^{-10}$
		S	$5.0.10^{-4}$	$4.6.10^{-9}$	$3.2.10^{-9}$		
Pm-148	5.37 d	M	$5.0.10^{-4}$	$2.0.10^{-9}$	$2.1.10^{-9}$	$5.0.10^{-4}$	$2.7.10^{-9}$
		S	$5.0.10^{-4}$	$2.1.10^{-9}$	$2.2.10^{-9}$		
Pm-148m	41.3 d	M	$5.0.10^{-4}$	$4.9.10^{-9}$	$4.1.10^{-9}$	$5.0.10^{-4}$	$1.8.10^{-9}$
		S	$5.0.10^{-4}$	$5.4.10^{-9}$	$4.3.10^{-9}$		
Pm-149	53.08 h	M	$5.0.10^{-4}$	$6.6.10^{-10}$	$7.6.10^{-10}$	$5.0.10^{-4}$	$9.9.10^{-10}$
		S	$5.0.10^{-4}$	$7.2.10^{-10}$	$8.2.10^{-10}$		
Pm-150	2.68 h	M	$5.0.10^{-4}$	$1.3.10^{-10}$	$2.0.10^{-10}$	$5.0.10^{-4}$	$2.6.10^{-10}$
		S	$5.0.10^{-4}$	$1.4.10^{-10}$	$2.1.10^{-10}$		
Pm-151	28.40 h	M	$5.0.10^{-4}$	$4.2.10^{-10}$	$6.1.10^{-10}$	$5.0.10^{-4}$	$7.3.10^{-10}$
		S	$5.0.10^{-4}$	$4.5.10^{-10}$	$6.4.10^{-10}$		
samarium							
Sm-141	10.2 min	M	$5.0.10^{-4}$	$1.6.10^{-11}$	$2.7.10^{-11}$	$5.0.10^{-4}$	$3.9.10^{-11}$
Sm-141m	22.6 min	M	$5.0.10^{-4}$	$3.4.10^{-11}$	$5.6.10^{-11}$	$5.0.10^{-4}$	$6.5.10^{-11}$
Sm-142	72.49 min	M	$5.0.10^{-4}$	$7.4.10^{-11}$	$1.1.10^{-10}$	$5.0.10^{-4}$	$1.9.10^{-10}$
Sm-145	340 d	M	$5.0.10^{-4}$	$1.5.10^{-9}$	$1.1.10^{-9}$	$5.0.10^{-4}$	$2.1.10^{-10}$
Sm-146	1.03×10^{8} y	M	$5.0.10^{-4}$	$9.9.10^{-6}$	$6.7.10^{-6}$	$5.0.10^{-4}$	$5.4.10^{-8}$
Sm-147	1.06×10^{11} y	M	$5.0.10^{-4}$	$8.9.10^{-6}$	$6.1.10^{-6}$	$5.0.10^{-4}$	$4.9.10^{-8}$
Sm-151	90 y	M	$5.0.10^{-4}$	$3.7.10^{-9}$	$2.6.10^{-9}$	$5.0.10^{-4}$	$9.8.10^{-11}$
Sm-153	46.7 h	M	$5.0.10^{-4}$	$6.1.10^{-10}$	$6.8.10^{-10}$	$5.0.10^{-4}$	$7.4.10^{-10}$
Sm-155	22.1 min	M	$5.0.10^{-4}$	$1.7.10^{-11}$	$2.8.10^{-11}$	$5.0.10^{-4}$	$2.9.10^{-11}$
Sm-156	9.4 h	M	$5.0.10^{-4}$	$2.1.10^{-10}$	$2.8.10^{-10}$	$5.0.10^{-4}$	$2.5.10^{-10}$
europium							
Eu-145	5.94 d	M	$5.0.10^{-4}$	$5.6.10^{-10}$	$7.3.10^{-10}$	$5.0.10^{-4}$	$7.5.10^{-10}$
Eu-146	4.61 d	M	$5.0.10^{-4}$	$8.2.10^{-10}$	$1.2.10^{-9}$	$5.0.10^{-4}$	$1.3.10^{-9}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] $d_{ama} = 1$ µm	h_{inh} [Sv/Bq] $d_{ama} = 5$ µm	f_1	h_{ing} [Sv/Bq]
Eu-147	24 d	M	$5.0.10^{-4}$	$1.0.10^{-9}$	$1.0.10^{-9}$	$5.0.10^{-4}$	$4.4.10^{-10}$
Eu-148	54.5 d	M	$5.0.10^{-4}$	$2.7.10^{-9}$	$2.3.10^{-9}$	$5.0.10^{-4}$	$1.3.10^{-9}$
Eu-149	93.1 d	M	$5.0.10^{-4}$	$2.7.10^{-10}$	$2.3.10^{-10}$	$5.0.10^{-4}$	$1.0.10^{-10}$
Eu-150	34.2 y	M	$5.0.10^{-4}$	$5.0.10^{-8}$	$3.4.10^{-8}$	$5.0.10^{-4}$	$1.3.10^{-9}$
Eu-150m	12.62 h	M	$5.0.10^{-4}$	$1.9.10^{-10}$	$2.8.10^{-10}$	$5.0.10^{-4}$	$3.8.10^{-10}$
Eu-152	13.33 y	M	$5.0.10^{-4}$	$3.9.10^{-8}$	$2.7.10^{-8}$	$5.0.10^{-4}$	$1.4.10^{-9}$
Eu-152m	9.32 h	M	$5.0.10^{-4}$	$2.2.10^{-10}$	$3.2.10^{-10}$	$5.0.10^{-4}$	$5.0.10^{-10}$
Eu-154	8.8 y	M	$5.0.10^{-4}$	$5.0.10^{-8}$	$3.5.10^{-8}$	$5.0.10^{-4}$	$2.0.10^{-9}$
Eu-155	4.96 y	M	$5.0.10^{-4}$	$6.5.10^{-9}$	$4.7.10^{-9}$	$5.0.10^{-4}$	$3.2.10^{-10}$
Eu-156	15.19 d	M	$5.0.10^{-4}$	$3.3.10^{-9}$	$3.0.10^{-9}$	$5.0.10^{-4}$	$2.2.10^{-9}$
Eu-157	15.15 h	M	$5.0.10^{-4}$	$3.2.10^{-10}$	$4.4.10^{-10}$	$5.0.10^{-4}$	$6.0.10^{-10}$
Eu-158	45.9 min	M	$5.0.10^{-4}$	$4.8.10^{-11}$	$7.5.10^{-11}$	$5.0.10^{-4}$	$9.4.10^{-11}$
gadolinium							
Gd-145	22.9 min	F	$5.0.10^{-4}$	$1.5.10^{-11}$	$2.6.10^{-11}$	$5.0.10^{-4}$	$4.4.10^{-11}$
		M	$5.0.10^{-4}$	$2.1.10^{-11}$	$3.5.10^{-11}$		
Gd-146	48.3 d	F	$5.0.10^{-4}$	$4.4.10^{-9}$	$5.2.10^{-9}$	$5.0.10^{-4}$	$9.6.10^{-10}$
		M	$5.0.10^{-4}$	$6.0.10^{-9}$	$4.6.10^{-9}$		
Gd-147	38.1 h	F	$5.0.10^{-4}$	$2.7.10^{-10}$	$4.5.10^{-10}$	$5.0.10^{-4}$	$6.1.10^{-10}$
		M	$5.0.10^{-4}$	$4.1.10^{-10}$	$5.9.10^{-10}$		
Gd-148	93 y	F	$5.0.10^{-4}$	$2.5.10^{-5}$	$3.0.10^{-5}$	$5.0.10^{-4}$	$5.5.10^{-8}$
		M	$5.0.10^{-4}$	$1.1.10^{-5}$	$7.2.10^{-6}$		
Gd-149	9.4 d	F	$5.0.10^{-4}$	$2.6.10^{-10}$	$4.5.10^{-10}$	$5.0.10^{-4}$	$4.5.10^{-10}$
		M	$5.0.10^{-4}$	$7.0.10^{-10}$	$7.9.10^{-10}$		
Gd-151	120 d	F	$5.0.10^{-4}$	$7.8.10^{-10}$	$9.3.10^{-10}$	$5.0.10^{-4}$	$2.0.10^{-10}$
		M	$5.0.10^{-4}$	$8.1.10^{-10}$	$6.5.10^{-10}$		
Gd-152	1.08×10^{14} y	F	$5.0.10^{-4}$	$1.9.10^{-5}$	$2.2.10^{-5}$	$5.0.10^{-4}$	$4.1.10^{-8}$
		M	$5.0.10^{-4}$	$7.4.10^{-6}$	$5.0.10^{-6}$		
Gd-153	242 d	F	$5.0.10^{-4}$	$2.1.10^{-9}$	$2.5.10^{-9}$	$5.0.10^{-4}$	$2.7.10^{-10}$
		M	$5.0.10^{-4}$	$1.9.10^{-9}$	$1.4.10^{-9}$		
Gd-159	18.56 h	F	$5.0.10^{-4}$	$1.1.10^{-10}$	$1.8.10^{-10}$	$5.0.10^{-4}$	$4.9.10^{-10}$
		M	$5.0.10^{-4}$	$2.7.10^{-10}$	$3.9.10^{-10}$		
terbium							
Tb-147	1.65 h	M	$5.0.10^{-4}$	$7.9.10^{-11}$	$1.2.10^{-10}$	$5.0.10^{-4}$	$1.6.10^{-10}$
Tb-149	4.15 h	M	$5.0.10^{-4}$	$4.3.10^{-9}$	$3.1.10^{-9}$	$5.0.10^{-4}$	$2.5.10^{-10}$
Tb-150	3.27 h	M	$5.0.10^{-4}$	$1.1.10^{-10}$	$1.8.10^{-10}$	$5.0.10^{-4}$	$2.5.10^{-10}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
Tb-151	17.6 h	M	$5.0.10^{-4}$	$2.3.10^{-10}$	$3.3.10^{-10}$	$5.0.10^{-4}$	$3.4.10^{-10}$
Tb-153	2.34 d	M	$5.0.10^{-4}$	$2.0.10^{-10}$	$2.4.10^{-10}$	$5.0.10^{-4}$	$2.5.10^{-10}$
Tb-154	21.4 h	M	$5.0.10^{-4}$	$3.8.10^{-10}$	$6.0.10^{-10}$	$5.0.10^{-4}$	$6.5.10^{-10}$
Tb-155	5.32 d	M	$5.0.10^{-4}$	$2.1.10^{-10}$	$2.5.10^{-10}$	$5.0.10^{-4}$	$2.1.10^{-10}$
Tb-156	5.34 d	M	$5.0.10^{-4}$	$1.2.10^{-9}$	$1.4.10^{-9}$	$5.0.10^{-4}$	$1.2.10^{-9}$
Tb-156m’	5.0 h	M	$5.0.10^{-4}$	$9.2.10^{-11}$	$1.3.10^{-10}$	$5.0.10^{-4}$	$8.1.10^{-11}$
Tb-156m	24.4 h	M	$5.0.10^{-4}$	$2.0.10^{-10}$	$2.3.10^{-10}$	$5.0.10^{-4}$	$1.7.10^{-10}$
Tb-157	150 y	M	$5.0.10^{-4}$	$1.1.10^{-9}$	$7.9.10^{-10}$	$5.0.10^{-4}$	$3.4.10^{-11}$
Tb-158	150 y	M	$5.0.10^{-4}$	$4.3.10^{-8}$	$3.0.10^{-8}$	$5.0.10^{-4}$	$1.1.10^{-9}$
Tb-160	72.3 d	M	$5.0.10^{-4}$	$6.6.10^{-9}$	$5.4.10^{-9}$	$5.0.10^{-4}$	$1.6.10^{-9}$
Tb-161	6.91 d	M	$5.0.10^{-4}$	$1.2.10^{-9}$	$1.2.10^{-9}$	$5.0.10^{-4}$	$7.2.10^{-10}$
dysprosium							
Dy-155	10.0 h	M	$5.0.10^{-4}$	$8.0.10^{-11}$	$1.2.10^{-10}$	$5.0.10^{-4}$	$1.3.10^{-10}$
Dy-157	8.1 h	M	$5.0.10^{-4}$	$3.2.10^{-11}$	$5.5.10^{-11}$	$5.0.10^{-4}$	$6.1.10^{-11}$
Dy-159	144.4 d	M	$5.0.10^{-4}$	$3.5.10^{-10}$	$2.5.10^{-10}$	$5.0.10^{-4}$	$1.0.10^{-10}$
Dy-165	2.334 h	M	$5.0.10^{-4}$	$6.1.10^{-11}$	$8.7.10^{-11}$	$5.0.10^{-4}$	$1.1.10^{-10}$
Dy-166	81.6 h	M	$5.0.10^{-4}$	$1.8.10^{-9}$	$1.8.10^{-9}$	$5.0.10^{-4}$	$1.6.10^{-9}$
holmium							
Ho-155	48 min	M	$5.0.10^{-4}$	$2.0.10^{-11}$	$3.2.10^{-11}$	$5.0.10^{-4}$	$3.7.10^{-11}$
Ho-157	12.6 min	M	$5.0.10^{-4}$	$4.5.10^{-12}$	$7.6.10^{-12}$	$5.0.10^{-4}$	$6.5.10^{-12}$
Ho-159	33 min	M	$5.0.10^{-4}$	$6.3.10^{-12}$	$1.0.10^{-11}$	$5.0.10^{-4}$	$7.9.10^{-12}$
Ho-161	2.5 h	M	$5.0.10^{-4}$	$6.3.10^{-12}$	$1.0.10^{-11}$	$5.0.10^{-4}$	$1.3.10^{-11}$
Ho-162	15 min	M	$5.0.10^{-4}$	$2.9.10^{-12}$	$4.5.10^{-12}$	$5.0.10^{-4}$	$3.3.10^{-12}$
Ho-162m	68 min	M	$5.0.10^{-4}$	$2.2.10^{-11}$	$3.3.10^{-11}$	$5.0.10^{-4}$	$2.6.10^{-11}$
Ho-164	29 min	M	$5.0.10^{-4}$	$8.6.10^{-12}$	$1.3.10^{-11}$	$5.0.10^{-4}$	$9.5.10^{-12}$
Ho-164m	37.5 min	M	$5.0.10^{-4}$	$1.2.10^{-11}$	$1.6.10^{-11}$	$5.0.10^{-4}$	$1.6.10^{-11}$
Ho-166	26.80 h	M	$5.0.10^{-4}$	$6.6.10^{-10}$	$8.3.10^{-10}$	$5.0.10^{-4}$	$1.4.10^{-9}$
Ho-166m	1.20×10^3 y	M	$5.0.10^{-4}$	$1.1.10^{-7}$	$7.8.10^{-8}$	$5.0.10^{-4}$	$2.0.10^{-9}$
Ho-167	3.1 h	M	$5.0.10^{-4}$	$7.1.10^{-11}$	$1.0.10^{-10}$	$5.0.10^{-4}$	$8.3.10^{-11}$
erbium							
Er-161	3.24 h	M	$5.0.10^{-4}$	$5.1.10^{-11}$	$8.5.10^{-11}$	$5.0.10^{-4}$	$8.0.10^{-11}$
Er-165	10.36 h	M	$5.0.10^{-4}$	$8.3.10^{-12}$	$1.4.10^{-11}$	$5.0.10^{-4}$	$1.9.10^{-11}$
Er-169	9.3 d	M	$5.0.10^{-4}$	$9.8.10^{-10}$	$9.2.10^{-10}$	$5.0.10^{-4}$	$3.7.10^{-10}$
Er-171	7.52 h	M	$5.0.10^{-4}$	$2.2.10^{-10}$	$3.0.10^{-10}$	$5.0.10^{-4}$	$3.6.10^{-10}$
Er-172	49.3 h	M	$5.0.10^{-4}$	$1.1.10^{-9}$	$1.2.10^{-9}$	$5.0.10^{-4}$	$1.0.10^{-9}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
thulium							
Tm-162	21.7 min	M	$5.0.10^{-4}$	$1.6.10^{-11}$	$2.7.10^{-11}$	$5.0.10^{-4}$	$2.9.10^{-11}$
Tm-166	7.70 h	M	$5.0.10^{-4}$	$1.8.10^{-10}$	$2.8.10^{-10}$	$5.0.10^{-4}$	$2.8.10^{-10}$
Tm-167	9.24 d	M	$5.0.10^{-4}$	$1.1.10^{-9}$	$1.0.10^{-9}$	$5.0.10^{-4}$	$5.6.10^{-10}$
Tm-170	128.6 d	M	$5.0.10^{-4}$	$6.6.10^{-9}$	$5.2.10^{-9}$	$5.0.10^{-4}$	$1.3.10^{-9}$
Tm-171	1.92 y	M	$5.0.10^{-4}$	$1.3.10^{-9}$	$9.1.10^{-10}$	$5.0.10^{-4}$	$1.1.10^{-10}$
Tm-172	63.6 h	M	$5.0.10^{-4}$	$1.1.10^{-9}$	$1.4.10^{-9}$	$5.0.10^{-4}$	$1.7.10^{-9}$
Tm-173	8.24 h	M	$5.0.10^{-4}$	$1.8.10^{-10}$	$2.6.10^{-10}$	$5.0.10^{-4}$	$3.1.10^{-10}$
Tm-175	15.2 min	M	$5.0.10^{-4}$	$1.9.10^{-11}$	$3.1.10^{-11}$	$5.0.10^{-4}$	$2.7.10^{-11}$
ytterbium							
Yb-162	18.9 min	M	$5.0.10^{-4}$	$1.4.10^{-11}$	$2.2.10^{-11}$	$5.0.10^{-4}$	$2.3.10^{-11}$
		S	$5.0.10^{-4}$	$1.4.10^{-11}$	$2.3.10^{-11}$		
Yb-166	56.7 h	M	$5.0.10^{-4}$	$7.2.10^{-10}$	$9.1.10^{-10}$	$5.0.10^{-4}$	$9.5.10^{-10}$
		S	$5.0.10^{-4}$	$7.6.10^{-10}$	$9.5.10^{-10}$		
Yb-167	17.5 min	M	$5.0.10^{-4}$	$6.5.10^{-12}$	$9.0.10^{-12}$	$5.0.10^{-4}$	$6.7.10^{-12}$
		S	$5.0.10^{-4}$	$6.9.10^{-12}$	$9.5.10^{-12}$		
Yb-169	32.01 d	M	$5.0.10^{-4}$	$2.4.10^{-9}$	$2.1.10^{-9}$	$5.0.10^{-4}$	$7.1.10^{-10}$
		S	$5.0.10^{-4}$	$2.8.10^{-9}$	$2.4.10^{-9}$		
Yb-175	4.19 d	M	$5.0.10^{-4}$	$6.3.10^{-10}$	$6.4.10^{-10}$	$5.0.10^{-4}$	$4.4.10^{-10}$
		S	$5.0.10^{-4}$	$7.0.10^{-10}$	$7.0.10^{-10}$		
Yb-177	1.9 h	M	$5.0.10^{-4}$	$6.4.10^{-11}$	$8.8.10^{-11}$	$5.0.10^{-4}$	$9.7.10^{-11}$
		S	$5.0.10^{-4}$	$6.9.10^{-11}$	$9.4.10^{-11}$		
Yb-178	74 min	M	$5.0.10^{-4}$	$7.1.10^{-11}$	$1.0.10^{-10}$	$5.0.10^{-4}$	$1.2.10^{-10}$
		S	$5.0.10^{-4}$	$7.6.10^{-11}$	$1.1.10^{-10}$		
lutetium							
Lu-169	34.06 h	M	$5.0.10^{-4}$	$3.5.10^{-10}$	$4.7.10^{-10}$	$5.0.10^{-4}$	$4.6.10^{-10}$
		S	$5.0.10^{-4}$	$3.8.10^{-10}$	$4.9.10^{-10}$		
Lu-170	2.00 d	M	$5.0.10^{-4}$	$6.4.10^{-10}$	$9.3.10^{-10}$	$5.0.10^{-4}$	$9.9.10^{-10}$
		S	$5.0.10^{-4}$	$6.7.10^{-10}$	$9.5.10^{-10}$		
Lu-171	8.22 d	M	$5.0.10^{-4}$	$7.6.10^{-10}$	$8.8.10^{-10}$	$5.0.10^{-4}$	$6.7.10^{-10}$
		S	$5.0.10^{-4}$	$8.3.10^{-10}$	$9.3.10^{-10}$		
Lu-172	6.70 d	M	$5.0.10^{-4}$	$1.4.10^{-9}$	$1.7.10^{-9}$	$5.0.10^{-4}$	$1.3.10^{-9}$
		S	$5.0.10^{-4}$	$1.5.10^{-9}$	$1.8.10^{-9}$		
Lu-173	1.37 y	M	$5.0.10^{-4}$	$2.0.10^{-9}$	$1.5.10^{-9}$	$5.0.10^{-4}$	$2.6.10^{-10}$
		S	$5.0.10^{-4}$	$2.3.10^{-9}$	$1.4.10^{-9}$		

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
Lu-174	3.31 y	M	$5.0.10^{-4}$	$4.0.10^{-9}$	$2.9.10^{-9}$	$5.0.10^{-4}$	$2.7.10^{-10}$
		S	$5.0.10^{-4}$	$3.9.10^{-9}$	$2.5.10^{-9}$		
Lu-174m	142 d	M	$5.0.10^{-4}$	$3.4.10^{-9}$	$2.4.10^{-9}$	$5.0.10^{-4}$	$5.3.10^{-10}$
		S	$5.0.10^{-4}$	$3.8.10^{-9}$	$2.6.10^{-9}$		
Lu-176	3.60×10^{10} y	M	$5.0.10^{-4}$	$6.6.10^{-8}$	$4.6.10^{-8}$	$5.0.10^{-4}$	$1.8.10^{-9}$
		S	$5.0.10^{-4}$	$5.2.10^{-8}$	$3.0.10^{-8}$		
Lu-176m	3.68 h	M	$5.0.10^{-4}$	$1.1.10^{-10}$	$1.5.10^{-10}$	$5.0.10^{-4}$	$1.7.10^{-10}$
		S	$5.0.10^{-4}$	$1.2.10^{-10}$	$1.6.10^{-10}$		
Lu-177	6.71 d	M	$5.0.10^{-4}$	$1.0.10^{-9}$	$1.0.10^{-9}$	$5.0.10^{-4}$	$5.3.10^{-10}$
		S	$5.0.10^{-4}$	$1.1.10^{-9}$	$1.1.10^{-9}$		
Lu-177m	160,9 d	M	$5.0.10^{-4}$	$1.2.10^{-8}$	$1.0.10^{-8}$	$5.0.10^{-4}$	$1.7.10^{-9}$
		S	$5.0.10^{-4}$	$1.5.10^{-8}$	$1.2.10^{-8}$		
Lu-178	28.4 min	M	$5.0.10^{-4}$	$2.5.10^{-11}$	$3.9.10^{-11}$	$5.0.10^{-4}$	$4.7.10^{-11}$
		S	$5.0.10^{-4}$	$2.6.10^{-11}$	$4.1.10^{-11}$		
Lu-178m	22.7 min	M	$5.0.10^{-4}$	$3.3.10^{-11}$	$5.4.10^{-11}$	$5.0.10^{-4}$	$3.8.10^{-11}$
		S	$5.0.10^{-4}$	$3.5.10^{-11}$	$5.6.10^{-11}$		
Lu-179	4.59 h	M	$5.0.10^{-4}$	$1.1.10^{-10}$	$1.6.10^{-10}$	$5.0.10^{-4}$	$2.1.10^{-10}$
		S	$5.0.10^{-4}$	$1.2.10^{-10}$	$1.6.10^{-10}$		
hafnium							
Hf-170	16.01 h	F	0.002	$1.7.10^{-10}$	$2.9.10^{-10}$	0.002	$4.8.10^{-10}$
		M	0.002	$3.2.10^{-10}$	$4.3.10^{-10}$		
Hf-172	1.87 y	F	0.002	$3.2.10^{-8}$	$3.7.10^{-8}$	0.002	$1.0.10^{-9}$
		M	0.002	$1.9.10^{-8}$	$1.3.10^{-8}$		
Hf-173	24.0 h	F	0.002	$7.9.10^{-11}$	$1.3.10^{-10}$	0.002	$2.3.10^{-10}$
		M	0.002	$1.6.10^{-10}$	$2.2.10^{-10}$		
Hf-175	70 d	F	0.002	$7.2.10^{-10}$	$8.7.10^{-10}$	0.002	$4.1.10^{-10}$
		M	0.002	$1.1.10^{-9}$	$8.8.10^{-10}$		
Hf-177m	51.4 min	F	0.002	$4.7.10^{-11}$	$8.4.10^{-11}$	0.002	$8.1.10^{-11}$
		M	0.002	$9.2.10^{-11}$	$1.5.10^{-10}$		
Hf-178m	31 y	F	0.002	$2.6.10^{-7}$	$3.1.10^{-7}$	0.002	$4.7.10^{-9}$
		M	0.002	$1.1.10^{-7}$	$7.8.10^{-8}$		
Hf-179m	25.1 d	F	0.002	$1.1.10^{-9}$	$1.4.10^{-9}$	0.002	$1.2.10^{-9}$
		M	0.002	$3.6.10^{-9}$	$3.2.10^{-9}$		
Hf-180m	5.5 h	F	0.002	$6.4.10^{-11}$	$1.2.10^{-10}$	0.002	$1.7.10^{-10}$
		M	0.002	$1.4.10^{-10}$	$2.0.10^{-10}$		

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
Hf-181	42.4 d	F	0.002	$1.4.10^{-9}$	$1.8.10^{-9}$	0.002	$1.1.10^{-9}$
		M	0.002	$4.7.10^{-9}$	$4.1.10^{-9}$		
Hf-182	9 x 10^{6} y	F	0.002	$3.0.10^{-7}$	$3.6.10^{-7}$	0.002	$3.0.10^{-9}$
		M	0.002	$1.2.10^{-7}$	$8.3.10^{-8}$		
Hf-182m	61.5 min	F	0.002	$2.3.10^{-11}$	$4.0.10^{-11}$	0.002	$4.2.10^{-11}$
		M	0.002	$4.7.10^{-11}$	$7.1.10^{-11}$		
Hf-183	64 min	F	0.002	$2.6.10^{-11}$	$4.4.10^{-11}$	0.002	$7.3.10^{-11}$
		M	0.002	$5.8.10^{-11}$	$8.3.10^{-11}$		
Hf-184	4.12 h	F	0.002	$1.3.10^{-10}$	$2.3.10^{-10}$	0.002	$5.2.10^{-10}$
		M	0.002	$3.3.10^{-10}$	$4.5.10^{-10}$		
tantalum							
Ta-172	36.8 min	M	0.001	$3.4.10^{-11}$	$5.5.10^{-11}$	0.001	$5.3.10^{-11}$
		S	0.001	$3.6.10^{-11}$	$5.7.10^{-11}$		
Ta-173	3.65 h	M	0.001	$1.1.10^{-10}$	$1.6.10^{-10}$	0.001	$1.9.10^{-10}$
		S	0.001	$1.2.10^{-10}$	$1.6.10^{-10}$		
Ta-174	1.2 h	M	0.001	$4.2.10^{-11}$	$6.3.10^{-11}$	0.001	$5.7.10^{-11}$
		S	0.001	$4.4.10^{-11}$	$6.6.10^{-11}$		
Ta-175	10,5 h	M	0.001	$1.3.10^{-10}$	$2.0.10^{-10}$	0.001	$2.1.10^{-10}$
		S	0.001	$1.4.10^{-10}$	$2.0.10^{-10}$		
Ta-176	8.08 h	M	0.001	$2.0.10^{-10}$	$3.2.10^{-10}$	0.001	$3.1.10^{-10}$
		S	0.001	$2.1.10^{-10}$	$3.3.10^{-10}$		
Ta-177	56.6 h	M	0.001	$9.3.10^{-11}$	$1.2.10^{-10}$	0.001	$1.1.10^{-10}$
		S	0.001	$1.0.10^{-10}$	$1.3.10^{-10}$		
Ta-178m	2.2 h	M	0.001	$6.6.10^{-11}$	$1.0.10^{-10}$	0.001	$7.8.10^{-11}$
		S	0.001	$6.9.10^{-11}$	$1.1.10^{-10}$		
Ta-179	664.9 d	M	0.001	$2.0.10^{-10}$	$1.3.10^{-10}$	0.001	$6.5.10^{-11}$
		S	0.001	$5.2.10^{-10}$	$2.9.10^{-10}$		
Ta-180	8.1 h	M	0.001	$4.4.10^{-11}$	$5.8.10^{-11}$	0.001	$5.4.10^{-11}$
		S	0.001	$4.7.10^{-11}$	$6.2.10^{-11}$		
Ta-182	115.0 d	M	0.001	$7.2.10^{-9}$	$5.8.10^{-9}$	0.001	$1.5.10^{-9}$
		S	0.001	$9.7.10^{-9}$	$7.4.10^{-9}$		
Ta-182m	15.84 min	M	0.001	$2.1.10^{-11}$	$3.4.10^{-11}$	0.001	$1.2.10^{-11}$
		S	0.001	$2.2.10^{-11}$	$3.6.10^{-11}$		
Ta-183	5.1 d	M	0.001	$1.8.10^{-9}$	$1.8.10^{-9}$	0.001	$1.3.10^{-9}$
		S	0.001	$2.0.10^{-9}$	$2.0.10^{-9}$		

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
Ta-184	8.7 h	M	0.001	$4.1.10^{-10}$	$6.0.10^{-10}$	0.001	$6.8.10^{-10}$
		S	0.001	$4.4.10^{-10}$	$6.3.10^{-10}$		
Ta-185	49 min	M	0.001	$4.6.10^{-11}$	$6.8.10^{-11}$	0.001	$6.8.10^{-11}$
		S	0.001	$4.9.10^{-11}$	$7.2.10^{-11}$		
Ta-186	10.5 min	M	0.001	$1.8.10^{-11}$	$3.0.10^{-11}$	0.001	$3.3.10^{-11}$
		S	0.001	$1.9.10^{-11}$	$3.1.10^{-11}$		
wolfram							
W-176	2.3 h	F	0.3	$4.4.10^{-11}$	$7.6.10^{-11}$	0.3	$1.0.10^{-10}$
						0.01	$1.1.10^{-10}$
W-177	135 min	F	0.3	$2.6.10^{-11}$	$4.6.10^{-11}$	0.3	$5.8.10^{-11}$
						0.01	$6.1.10^{-11}$
W-178	21.7 d	F	0.3	$7.6.10^{-11}$	$1.2.10^{-10}$	0.3	$2.2.10^{-10}$
						0.01	$2.5.10^{-10}$
W-179	37.5 min	F	0.3	$9.9.10^{-13}$	$1.8.10^{-12}$	0.3	$3.3.10^{-12}$
						0.01	$3.3.10^{-12}$
W-181	121.2 d	F	0.3	$2.8.10^{-11}$	$4.3.10^{-11}$	0.3	$7.6.10^{-11}$
						0.01	$8.2.10^{-11}$
W-185	75.1 d	F	0.3	$1.4.10^{-10}$	$2.2.10^{-10}$	0.3	$4.4.10^{-10}$
						0.01	$5.0.10^{-10}$
W-187	23.9 h	F	0.3	$2.0.10^{-10}$	$3.3.10^{-10}$	0.3	$6.3.10^{-10}$
						0.01	$7.1.10^{-10}$
W-188	69.4 d	F	0.3	$5.9.10^{-10}$	$8.4.10^{-10}$	0.3	$2.1.10^{-9}$
						0.01	$2.3.10^{-9}$
rhenium							
Re-177	14.0 min	F	0.8	$1.0.10^{-11}$	$1.7.10^{-11}$	0.8	$2.2.10^{-11}$
		M	0.8	$1.4.10^{-11}$	$2.2.10^{-11}$		
Re-178	13.2 min	F	0.8	$1.1.10^{-11}$	$1.8.10^{-11}$	0.8	$2.5.10^{-11}$
		M	0.8	$1.5.10^{-11}$	$2.4.10^{-11}$		
Re-181	20 h	F	0.8	$1.9.10^{-10}$	$3.0.10^{-10}$	0.8	$4.2.10^{-10}$
		M	0.8	$2.5.10^{-10}$	$3.7.10^{-10}$		
Re-182	64.0 h	F	0.8	$6.8.10^{-10}$	$1.1.10^{-9}$	0.8	$1.4.10^{-9}$
		M	0.8	$1.3.10^{-9}$	$1.7.10^{-9}$		
Re-182m	12.7 h	F	0.8	$1.5.10^{-10}$	$2.4.10^{-10}$	0.8	$2.7.10^{-10}$
		M	0.8	$2.0.10^{-10}$	$3.0.10^{-10}$		
Re-184	38.0 d	F	0.8	$4.6.10^{-10}$	$7.0.10^{-10}$	0.8	$1.0.10^{-9}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		M	0.8	$1.8.10^{-9}$	$1.8.10^{-9}$		
Re-184m	165 d	F	0.8	$6.1.10^{-10}$	$8.8.10^{-10}$	0.8	$1.5.10^{-9}$
		M	0.8	$6.1.10^{-9}$	$4.8.10^{-9}$		
Re-186	90,64 h	F	0.8	$5.3.10^{-10}$	$7.3.10^{-10}$	0.8	$1.5.10^{-9}$
		M	0.8	$1.1.10^{-9}$	$1.2.10^{-9}$		
Re-186m	2.0×10^5 y	F	0.8	$8.5.10^{-10}$	$1.2.10^{-9}$	0.8	$2.2.10^{-9}$
		M	0.8	$1.1.10^{-8}$	$7.9.10^{-9}$		
Re-187	5×10^{10} y	F	0.8	$1.9.10^{-12}$	$2.6.10^{-12}$	0.8	$5.1.10^{-12}$
		M	0.8	$6.0.10^{-12}$	$4.6.10^{-12}$		
Re-188	16.98 h	F	0.8	$4.7.10^{-10}$	$6.6.10^{-10}$	0.8	$1.4.10^{-9}$
		M	0.8	$5.5.10^{-10}$	$7.4.10^{-10}$		
Re-188m	18.6 min	F	0.8	$1.0.10^{-11}$	$1.6.10^{-11}$	0.8	$3.0.10^{-11}$
		M	0.8	$1.4.10^{-11}$	$2.0.10^{-11}$		
Re-189	24.3 h	F	0.8	$2.7.10^{-10}$	$4.3.10^{-10}$	0.8	$7.8.10^{-10}$
		M	0.8	$4.3.10^{-10}$	$6.0.10^{-10}$		
osmium							
Os-180	22 min	F	0.01	$8.8.10^{-12}$	$1.6.10^{-11}$	0.01	$1.7.10^{-11}$
		M	0.01	$1.4.10^{-11}$	$2.4.10^{-11}$		
		S	0.01	$1.5.10^{-11}$	$2.5.10^{-11}$		
Os-181	105 min	F	0.01	$3.6.10^{-11}$	$6.4.10^{-11}$	0.01	$8.9.10^{-11}$
		M	0.01	$6.3.10^{-11}$	$9.6.10^{-11}$		
		S	0.01	$6.6.10^{-11}$	$1.0.10^{-10}$		
Os-182	22 h	F	0.01	$1.9.10^{-10}$	$3.2.10^{-10}$	0.01	$5.6.10^{-10}$
		M	0.01	$3.7.10^{-10}$	$5.0.10^{-10}$		
		S	0.01	$3.9.10^{-10}$	$5.2.10^{-10}$		
Os-185	94 d	F	0.01	$1.1.10^{-9}$	$1.4.10^{-9}$	0.01	$5.1.10^{-10}$
		M	0.01	$1.2.10^{-9}$	$1.0.10^{-9}$		
		S	0.01	$1.5.10^{-9}$	$1.1.10^{-9}$		
Os-189m	6.0 h	F	0.01	$2.7.10^{-12}$	$5.2.10^{-12}$	0.01	$1.8.10^{-11}$
		M	0.01	$5.1.10^{-12}$	$7.6.10^{-12}$		
		S	0.01	$5.4.10^{-12}$	$7.9.10^{-12}$		
Os-191	15.4 d	F	0.01	$2.5.10^{-10}$	$3.5.10^{-10}$	0.01	$5.7.10^{-10}$
		M	0.01	$1.5.10^{-9}$	$1.3.10^{-9}$		
		S	0.01	$1.8.10^{-9}$	$1.5.10^{-9}$		
Os-191m	13.03 h	F	0.01	$2.6.10^{-11}$	$4.1.10^{-11}$	0.01	$9.6.10^{-11}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq]		f_1	h_{ing} [Sv/Bq]
				d_{ama} = 1 µm	d_{ama} = 5 µm		
		M	0.01	$1.3.10^{-10}$	$1.3.10^{-10}$		
		S	0.01	$1.5.10^{-10}$	$1.4.10^{-10}$		
Os-193	30.0 h	F	0.01	$1.7.10^{-10}$	$2.8.10^{-10}$	0.01	$8.1.10^{-10}$
		M	0.01	$4.7.10^{-10}$	$6.4.10^{-10}$		
		S	0.01	$5.1.10^{-10}$	$6.8.10^{-10}$		
Os-194	6.0 y	F	0.01	$1.1.10^{-8}$	$1.3.10^{-8}$	0.01	$2.4.10^{-9}$
		M	0.01	$2.0.10^{-8}$	$1.3.10^{-8}$		
		S	0.01	$7.9.10^{-8}$	$4.2.10^{-8}$		
iridium							
Ir-182	15 min	F	0.01	$1.5.10^{-11}$	$2.6.10^{-11}$	0.01	$4.8.10^{-11}$
		M	0.01	$2.4.10^{-11}$	$3.9.10^{-11}$		
		S	0.01	$2.5.10^{-11}$	$4.0.10^{-11}$		
Ir-184	3.02 h	F	0.01	$6.7.10^{-11}$	$1.2.10^{-10}$	0.01	$1.7.10^{-10}$
		M	0.01	$1.1.10^{-10}$	$1.8.10^{-10}$		
		S	0.01	$1.2.10^{-10}$	$1.9.10^{-10}$		
Ir-185	14.0 h	F	0.01	$8.8.10^{-11}$	$1.5.10^{-10}$	0.01	$2.6.10^{-10}$
		M	0.01	$1.8.10^{-10}$	$2.5.10^{-10}$		
		S	0.01	$1.9.10^{-10}$	$2.6.10^{-10}$		
Ir-186	15.8 h	F	0.01	$1.8.10^{-10}$	$3.3.10^{-10}$	0.01	$4.9.10^{-10}$
		M	0.01	$3.2.10^{-10}$	$4.8.10^{-10}$		
		S	0.01	$3.3.10^{-10}$	$5.0.10^{-10}$		
Ir-186m	1.75 h	F	0.01	$2.5.10^{-11}$	$4.5.10^{-11}$	0.01	$6.1.10^{-11}$
		M	0.01	$4.3.10^{-11}$	$6.9.10^{-11}$		
		S	0.01	$4.5.10^{-11}$	$7.1.10^{-11}$		
Ir-187	10,5 h	F	0.01	$4.0.10^{-11}$	$7.2.10^{-11}$	0.01	$1.2.10^{-10}$
		M	0.01	$7.5.10^{-11}$	$1.1.10^{-10}$		
		S	0.01	$7.9.10^{-11}$	$1.2.10^{-10}$		
Ir-188	41.5 h	F	0.01	$2.6.10^{-10}$	$4.4.10^{-10}$	0.01	$6.3.10^{-10}$
		M	0.01	$4.1.10^{-10}$	$6.0.10^{-10}$		
		S	0.01	$4.3.10^{-10}$	$6.2.10^{-10}$		
Ir-189	13.3 d	F	0.01	$1.1.10^{-10}$	$1.7.10^{-10}$	0.01	$2.4.10^{-10}$
		M	0.01	$4.8.10^{-10}$	$4.1.10^{-10}$		
		S	0.01	$5.5.10^{-10}$	$4.6.10^{-10}$		
Ir-190	12.1 d	F	0.01	$7.9.10^{-10}$	$1.2.10^{-9}$	0.01	$1.2.10^{-9}$
		M	0.01	$2.0.10^{-9}$	$2.3.10^{-9}$		

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq]		f_1	h_{ing} [Sv/Bq]
				d_{ama} = 1 µm	d_{ama} = 5 µm		
		S	0.01	$2.3.10^{-9}$	$2.5.10^{-9}$		
Ir-190m'	3.1 h	F	0.01	$5.3.10^{-11}$	$9.7.10^{-11}$	0.01	$1.2.10^{-10}$
		M	0.01	$8.3.10^{-11}$	$1.4.10^{-10}$		
		S	0.01	$8.6.10^{-11}$	$1.4.10^{-10}$		
Ir-190m	1.2 h	F	0.01	$3.7.10^{-12}$	$5.6.10^{-12}$	0.01	$8.0.10^{-12}$
		M	0.01	$9.0.10^{-12}$	$1.0.10^{-11}$		
		S	0.01	$1.0.10^{-11}$	$1.1.10^{-11}$		
Ir-192	74.02 d	F	0.01	$1.8.10^{-9}$	$2.2.10^{-9}$	0.01	$1.4.10^{-9}$
		M	0.01	$4.9.10^{-9}$	$4.1.10^{-9}$		
		S	0.01	$6.2.10^{-9}$	$4.9.10^{-9}$		
Ir-192m'	241 y	F	0.01	$4.8.10^{-9}$	$5.6.10^{-9}$	0.01	$3.1.10^{-10}$
		M	0.01	$5.4.10^{-9}$	$3.4.10^{-9}$		
		S	0.01	$3.6.10^{-8}$	$1.9.10^{-8}$		
Ir-193m	11.9 d	F	0.01	$1.0.10^{-10}$	$1.6.10^{-10}$	0.01	$2.7.10^{-10}$
		M	0.01	$1.0.10^{-9}$	$9.1.10^{-10}$		
		S	0.01	$1.2.10^{-9}$	$1.0.10^{-9}$		
Ir-194	19.15 h	F	0.01	$2.2.10^{-10}$	$3.6.10^{-10}$	0.01	$1.3.10^{-9}$
		M	0.01	$5.3.10^{-10}$	$7.1.10^{-10}$		
		S	0.01	$5.6.10^{-10}$	$7.5.10^{-10}$		
Ir-194m	171 d	F	0.01	$5.4.10^{-9}$	$6.5.10^{-9}$	0.01	$2.1.10^{-9}$
		M	0.01	$8.5.10^{-9}$	$6.5.10^{-9}$		
		S	0.01	$1.2.10^{-8}$	$8.2.10^{-9}$		
Ir-195	2.5 h	F	0.01	$2.6.10^{-11}$	$4.5.10^{-11}$	0.01	$1.0.10^{-10}$
		M	0.01	$6.7.10^{-11}$	$9.6.10^{-11}$		
		S	0.01	$7.2.10^{-11}$	$1.0.10^{-10}$		
Ir-195m	3.8 h	F	0.01	$6.5.10^{-11}$	$1.1.10^{-10}$	0.01	$2.1.10^{-10}$
		M	0.01	$1.6.10^{-10}$	$2.3.10^{-10}$		
		S	0.01	$1.7.10^{-10}$	$2.4.10^{-10}$		
platinum							
Pt-186	2.0 h	F	0.01	$3.6.10^{-11}$	$6.6.10^{-11}$	0.01	$9.3.10^{-11}$
Pt-188	10,2 d	F	0.01	$4.3.10^{-10}$	$6.3.10^{-10}$	0.01	$7.6.10^{-10}$
Pt-189	10,87 h	F	0.01	$4.1.10^{-11}$	$7.3.10^{-11}$	0.01	$1.2.10^{-10}$
Pt-191	2,8 d	F	0.01	$1.1.10^{-10}$	$1.9.10^{-10}$	0.01	$3.4.10^{-10}$
Pt-193	50 y	F	0.01	$2.1.10^{-11}$	$2.7.10^{-11}$	0.01	$3.1.10^{-11}$
Pt-193m	4.33 d	F	0.01	$1.3.10^{-10}$	$2.1.10^{-10}$	0.01	$4.5.10^{-10}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
Pt-195m	4.02 d	F	0.01	$1.9.10^{-10}$	$3.1.10^{-10}$	0.01	$6.3.10^{-10}$
Pt-197	18.3 h	F	0.01	$9.1.10^{-11}$	$1.6.10^{-10}$	0.01	$4.0.10^{-10}$
Pt-197m	94.4 min	F	0.01	$2.5.10^{-11}$	$4.3.10^{-11}$	0.01	$8.4.10^{-11}$
Pt-199	30.8 min	F	0.01	$1.3.10^{-11}$	$2.2.10^{-11}$	0.01	$3.9.10^{-11}$
Pt-200	12.5 h	F	0.01	$2.4.10^{-10}$	$4.0.10^{-10}$	0.01	$1.2.10^{-9}$
gold							
Au-193	17.65 h	F	0.1	$3.9.10^{-11}$	$7.1.10^{-11}$	0.1	$1.3.10^{-10}$
		M	0.1	$1.1.10^{-10}$	$1.5.10^{-10}$		
		S	0.1	$1.2.10^{-10}$	$1.6.10^{-10}$		
Au-194	39.5 h	F	0.1	$1.5.10^{-10}$	$2.8.10^{-10}$	0.1	$4.2.10^{-10}$
		M	0.1	$2.4.10^{-10}$	$3.7.10^{-10}$		
		S	0.1	$2.5.10^{-10}$	$3.8.10^{-10}$		
Au-195	183 d	F	0.1	$7.1.10^{-11}$	$1.2.10^{-10}$	0.1	$2.5.10^{-10}$
		M	0.1	$1.0.10^{-9}$	$8.0.10^{-10}$		
		S	0.1	$1.6.10^{-9}$	$1.2.10^{-9}$		
Au-198	2.696 d	F	0.1	$2.3.10^{-10}$	$3.9.10^{-10}$	0.1	$1.0.10^{-9}$
		M	0.1	$7.6.10^{-10}$	$9.8.10^{-10}$		
		S	0.1	$8.4.10^{-10}$	$1.1.10^{-9}$		
Au-198m	2.30 d	F	0.1	$3.4.10^{-10}$	$5.9.10^{-10}$	0.1	$1.3.10^{-9}$
		M	0.1	$1.7.10^{-9}$	$2.0.10^{-9}$		
		S	0.1	$1.9.10^{-9}$	$1.9.10^{-9}$		
Au-199	3.139 d	F	0.1	$1.1.10^{-10}$	$1.9.10^{-10}$	0.1	$4.4.10^{-10}$
		M	0.1	$6.8.10^{-10}$	$6.8.10^{-10}$		
		S	0.1	$7.5.10^{-10}$	$7.6.10^{-10}$		
Au-200	48.4 min	F	0.1	$1.7.10^{-11}$	$3.0.10^{-11}$	0.1	$6.8.10^{-11}$
		M	0.1	$3.5.10^{-11}$	$5.3.10^{-11}$		
		S	0.1	$3.6.10^{-11}$	$5.6.10^{-11}$		
Au-200m	18.7 h	F	0.1	$3.2.10^{-10}$	$5.7.10^{-10}$	0.1	$1.1.10^{-9}$
		M	0.1	$6.9.10^{-10}$	$9.8.10^{-10}$		
		S	0.1	$7.3.10^{-10}$	$1.0.10^{-9}$		
Au-201	26.4 min	F	0.1	$9.2.10^{-12}$	$1.6.10^{-11}$	0.1	$2.4.10^{-11}$
		M	0.1	$1.7.10^{-11}$	$2.8.10^{-11}$		
		S	0.1	$1.8.10^{-11}$	$2.9.10^{-11}$		
mercury							
Hg-193 inorg.	3.5 h	F	0.02	$2.8.10^{-11}$	$5.0.10^{-11}$	0.02	$8.2.10^{-11}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		M	0.02	$7.5.10^{-11}$	$1.0.10^{-10}$		
Hg-193 org.		F	0.4	$2.6.10^{-11}$	$4.7.10^{-11}$	1	$3.1.10^{-11}$
						0.4	$6.6.10^{-11}$
Hg-193m inorg.	11.1 h	F	0.02	$1.2.10^{-10}$	$2.3.10^{-10}$	0.02	$4.0.10^{-10}$
		M	0.02	$2.6.10^{-10}$	$3.8.10^{-10}$		
Hg-193m org.		F	0.4	$1.1.10^{-10}$	$2.0.10^{-10}$	1	$1.3.10^{-10}$
						0.4	$3.0.10^{-10}$
Hg-194 inorg.	260 y	F	0.02	$1.3.10^{-8}$	$1.5.10^{-8}$	0.02	$1.4.10^{-9}$
		M	0.02	$7.8.10^{-9}$	$5.3.10^{-9}$		
Hg-194 org.		F	0.4	$1.5.10^{-8}$	$1.9.10^{-8}$	1	$5.1.10^{-8}$
						0.4	$2.1.10^{-8}$
Hg-195 inorg.	9.9 h	F	0.02	$2.7.10^{-11}$	$4.8.10^{-11}$	0.02	$9.7.10^{-11}$
		M	0.02	$7.2.10^{-11}$	$9.2.10^{-11}$		
Hg-195 org.		F	0.4	$2.4.10^{-11}$	$4.4.10^{-11}$	1	$3.4.10^{-11}$
						0.4	$7.5.10^{-11}$
Hg-195m inorg.	41.6 h	F	0.02	$1.5.10^{-10}$	$2.6.10^{-10}$	0.02	$5.6.10^{-10}$
		M	0.02	$5.1.10^{-10}$	$6.5.10^{-10}$		
Hg-195m org.		F	0.4	$1.3.10^{-10}$	$2.2.10^{-10}$	1	$2.2.10^{-10}$
						0.4	$4.1.10^{-10}$
Hg-197 inorg.	64.1 h	F	0.02	$6.0.10^{-11}$	$1.0.10^{-10}$	0.02	$2.3.10^{-10}$
		M	0.02	$2.9.10^{-10}$	$2.8.10^{-10}$		
Hg-197 org.		F	0.4	$5.0.10^{-11}$	$8.5.10^{-11}$	1	$9.9.10^{-11}$
						0.4	$1.7.10^{-10}$
Hg-197m inorg.	23.8 h	F	0.02	$1.2.10^{-10}$	$2.1.10^{-10}$	0.02	$4.7.10^{-10}$
		M	0.02	$5.1.10^{-10}$	$6.6.10^{-10}$		
Hg-197m org.		F	0.4	$1.0.10^{-10}$	$1.8.10^{-10}$	1	$1.5.10^{-10}$
						0.4	$3.4.10^{-10}$
Hg-199m inorg.	42.6 min	F	0.02	$1.6.10^{-11}$	$2.7.10^{-11}$	0.02	$3.1.10^{-11}$
		M	0.02	$3.3.10^{-11}$	$5.2.10^{-11}$		
Hg-199m org.		F	0.4	$1.6.10^{-11}$	$2.7.10^{-11}$	1	$2.8.10^{-11}$
						0.4	$3.1.10^{-11}$
Hg-203 inorg.	46.60 d	F	0.02	$4.7.10^{-10}$	$5.9.10^{-10}$	0.02	$5.4.10^{-10}$
		M	0.02	$2.3.10^{-9}$	$1.9.10^{-9}$		
Hg-203 org.		F	0.4	$5.7.10^{-10}$	$7.5.10^{-10}$	1	$1.9.10^{-9}$
						0.4	$1.1.10^{-9}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
thallium							
Tl-194	33 min	F	1	$4.8.10^{-12}$	$8.9.10^{-12}$	1	$8.1.10^{-12}$
Tl-194m	32.8 min	F	1	$2.0.10^{-11}$	$3.6.10^{-11}$	1	$4.0.10^{-11}$
Tl-195	1.16 h	F	1	$1.6.10^{-11}$	$3.0.10^{-11}$	1	$2.7.10^{-11}$
Tl-197	2,84 h	F	1	$1.5.10^{-11}$	$2.7.10^{-11}$	1	$2.3.10^{-11}$
Tl-198	5.3 h	F	1	$6.6.10^{-11}$	$1.2.10^{-10}$	1	$7.3.10^{-11}$
Tl-198m	1.87 h	F	1	$4.0.10^{-11}$	$7.3.10^{-11}$	1	$5.4.10^{-11}$
Tl-199	7.42 h	F	1	$2.0.10^{-11}$	$3.7.10^{-11}$	1	$2.6.10^{-11}$
Tl-200	26.1 h	F	1	$1.4.10^{-10}$	$2.5.10^{-10}$	1	$2.0.10^{-10}$
Tl-201	3.044 d	F	1	$4.7.10^{-11}$	$7.6.10^{-11}$	1	$9.5.10^{-11}$
Tl-202	12.23 d	F	1	$2.0.10^{-10}$	$3.1.10^{-10}$	1	$4.5.10^{-10}$
Tl-204	3.779 y	F	1	$4.4.10^{-10}$	$6.2.10^{-10}$	1	$1.3.10^{-9}$
lead							
Pb-195m	15.8 min	F	0.2	$1.7.10^{-11}$	$3.0.10^{-11}$	0.2	$2.9.10^{-11}$
Pb-198	2.4 h	F	0.2	$4.7.10^{-11}$	$8.7.10^{-11}$	0.2	$1.0.10^{-10}$
Pb-199	90 min	F	0.2	$2.6.10^{-11}$	$4.8.10^{-11}$	0.2	$5.4.10^{-11}$
Pb-200	21.5 h	F	0.2	$1.5.10^{-10}$	$2.6.10^{-10}$	0.2	$4.0.10^{-10}$
Pb-201	9.4 h	F	0.2	$6.5.10^{-11}$	$1.2.10^{-10}$	0.2	$1.6.10^{-10}$
Pb-202	3×10^5 y	F	0.2	$1.1.10^{-8}$	$1.4.10^{-8}$	0.2	$8.7.10^{-9}$
Pb-202m	3.62 h	F	0.2	$6.7.10^{-11}$	$1.2.10^{-10}$	0.2	$1.3.10^{-10}$
Pb-203	52.05 h	F	0.2	$9.1.10^{-11}$	$1.6.10^{-10}$	0.2	$2.4.10^{-10}$
Pb-205	1.43×10^7 y	F	0.2	$3.4.10^{-10}$	$4.1.10^{-10}$	0.2	$2.8.10^{-10}$
Pb-209	3.253 h	F	0.2	$1.8.10^{-11}$	$3.2.10^{-11}$	0.2	$5.7.10^{-11}$
Pb-210	22.3 y	F	0.2	$8.9.10^{-7}$	$1.1.10^{-6}$	0.2	$6.8.10^{-7}$
Pb-211	36.1 min	F	0.2	$3.9.10^{-9}$	$5.6.10^{-9}$	0.2	$1.8.10^{-10}$
Pb-212	10,64 h	F	0.2	$1.9.10^{-8}$	$3.3.10^{-8}$	0.2	$5.9.10^{-9}$
Pb-214	26.8 min	F	0.2	$2.9.10^{-9}$	$4.8.10^{-9}$	0.2	$1.4.10^{-10}$
bismuth							
Bi-200	36.4 min	F	0.05	$2.4.10^{-11}$	$4.2.10^{-11}$	0.05	$5.1.10^{-11}$
		M	0.05	$3.4.10^{-11}$	$5.6.10^{-11}$		
Bi-201	108 min	F	0.05	$4.7.10^{-11}$	$8.3.10^{-11}$	0.05	$1.2.10^{-10}$
		M	0.05	$7.0.10^{-11}$	$1.1.10^{-10}$		
Bi-202	1.67 h	F	0.05	$4.6.10^{-11}$	$8.4.10^{-11}$	0.05	$8.9.10^{-11}$
		M	0.05	$5.8.10^{-11}$	$1.0.10^{-10}$		
Bi-203	11.76 h	F	0.05	$2.0.10^{-10}$	$3.6.10^{-10}$	0.05	$4.8.10^{-10}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		M	0.05	$2.8.10^{-10}$	$4.5.10^{-10}$		
Bi-205	15.31 d	F	0.05	$4.0.10^{-10}$	$6.8.10^{-10}$	0.05	$9.0.10^{-10}$
		M	0.05	$9.2.10^{-10}$	$1.0.10^{-9}$		
Bi-206	6.243 d	F	0.05	$7.9.10^{-10}$	$1.3.10^{-9}$	0.05	$1.9.10^{-9}$
		M	0.05	$1.7.10^{-9}$	$2.1.10^{-9}$		
Bi-207	38 y	F	0.05	$5.2.10^{-10}$	$8.4.10^{-10}$	0.05	$1.3.10^{-9}$
		M	0.05	$5.2.10^{-9}$	$3.2.10^{-9}$		
Bi-210	5.012 d	F	0.05	$1.1.10^{-9}$	$1.4.10^{-9}$	0.05	$1.3.10^{-9}$
		M	0.05	$8.4.10^{-8}$	$6.0.10^{-8}$		
Bi-210m	3.0×10^{6} y	F	0.05	$4.5.10^{-8}$	$5.3.10^{-8}$	0.05	$1.5.10^{-8}$
		M	0.05	$3.1.10^{-6}$	$2.1.10^{-6}$		
Bi-212	60.55 min	F	0.05	$9.3.10^{-9}$	$1.5.10^{-8}$	0.05	$2.6.10^{-10}$
		M	0.05	$3.0.10^{-8}$	$3.9.10^{-8}$		
Bi-213	45.65 min	F	0.05	$1.1.10^{-8}$	$1.8.10^{-8}$	0.05	$2.0.10^{-10}$
		M	0.05	$2.9.10^{-8}$	$4.1.10^{-8}$		
Bi-214	19.9 min	F	0.05	$7.2.10^{-9}$	$1.2.10^{-8}$	0.05	$1.1.10^{-10}$
		M	0.05	$1.4.10^{-8}$	$2.1.10^{-8}$		
polonium							
Po-203	36.7 min	F	0.1	$2.5.10^{-11}$	$4.5.10^{-11}$	0.1	$5.2.10^{-11}$
		M	0.1	$3.6.10^{-11}$	$6.1.10^{-11}$		
Po-205	1.80 h	F	0.1	$3.5.10^{-11}$	$6.0.10^{-11}$	0.1	$5.9.10^{-11}$
		M	0.1	$6.4.10^{-11}$	$8.9.10^{-11}$		
Po-207	350 min	F	0.1	$6.3.10^{-11}$	$1.2.10^{-10}$	0.1	$1.4.10^{-10}$
		M	0.1	$8.4.10^{-11}$	$1.5.10^{-10}$		
Po-210	138.38 d	F	0.1	$6.0.10^{-7}$	$7.1.10^{-7}$	0.1	$2.4.10^{-7}$
		M	0.1	$3.0.10^{-6}$	$2.2.10^{-6}$		
astatine							
At-207	1.80 h	F	1	$3.5.10^{-10}$	$4.4.10^{-10}$	1	$2.3.10^{-10}$
		M	1	$2.1.10^{-9}$	$1.9.10^{-9}$		
At-211	7.214 h	F	1	$1.6.10^{-8}$	$2.7.10^{-8}$	1	$1.1.10^{-8}$
		M	1	$9.8.10^{-8}$	$1.1.10^{-7}$		
francium							
Fr-222	14.4 min	F	1	$1.4.10^{-8}$	$2.1.10^{-8}$	1	$7.1.10^{-10}$
Fr-223	21.8 min	F	1	$9.1.10^{-10}$	$1.3.10^{-9}$	1	$2.3.10^{-9}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
radium							
Ra-223	11.434 d	M	0.2	$6.9.10^{-6}$	$5.7.10^{-6}$	0.2	$1.0.10^{-7}$
Ra-224	3.66 d	M	0.2	$2.9.10^{-6}$	$2.4.10^{-6}$	0.2	$6.5.10^{-8}$
Ra-225	14.8 d	M	0.2	$5.8.10^{-6}$	$4.8.10^{-6}$	0.2	$9.5.10^{-8}$
Ra-226	1600 y	M	0.2	$3.2.10^{-6}$	$2.2.10^{-6}$	0.2	$2.8.10^{-7}$
Ra-227	42.2 min	M	0.2	$2.8.10^{-10}$	$2.1.10^{-10}$	0.2	$8.4.10^{-11}$
Ra-228	5.75 y	M	0.2	$2.6.10^{-6}$	$1.7.10^{-6}$	0.2	$6.7.10^{-7}$
actinium							
Ac-224	2.9 h	F	$5.0.10^{-4}$	$1.1.10^{-8}$	$1.3.10^{-8}$	$5.0.10^{-4}$	$7.0.10^{-10}$
		M	$5.0.10^{-4}$	$1.0.10^{-7}$	$8.9.10^{-8}$		
		S	$5.0.10^{-4}$	$1.2.10^{-7}$	$9.9.10^{-8}$		
Ac-225	10.0 d	F	$5.0.10^{-4}$	$8.7.10^{-7}$	$1.0.10^{-6}$	$5.0.10^{-4}$	$2.4.10^{-8}$
		M	$5.0.10^{-4}$	$6.9.10^{-6}$	$5.7.10^{-6}$		
		S	$5.0.10^{-4}$	$7.9.10^{-6}$	$6.5.10^{-6}$		
Ac-226	29 h	F	$5.0.10^{-4}$	$9.5.10^{-8}$	$2.2.10^{-7}$	$5.0.10^{-4}$	$1.0.10^{-8}$
		M	$5.0.10^{-4}$	$1.1.10^{-6}$	$9.2.10^{-7}$		
		S	$5.0.10^{-4}$	$1.2.10^{-6}$	$1.0.10^{-6}$		
Ac-227	21.773 y	F	$5.0.10^{-4}$	$5.4.10^{-4}$	$6.3.10^{-4}$	$5.0.10^{-4}$	$1.1.10^{-6}$
		M	$5.0.10^{-4}$	$2.1.10^{-4}$	$1.5.10^{-4}$		
		S	$5.0.10^{-4}$	$6.6.10^{-5}$	$4.7.10^{-5}$		
Ac-228	6.13 h	F	$5.0.10^{-4}$	$2.5.10^{-8}$	$2.9.10^{-8}$	$5.0.10^{-4}$	$4.3.10^{-10}$
		M	$5.0.10^{-4}$	$1.6.10^{-8}$	$1.2.10^{-8}$		
		S	$5.0.10^{-4}$	$1.4.10^{-8}$	$1.2.10^{-8}$		
thorium							
Th-226	30.9 min	M	$5.0.10^{-4}$	$5.5.10^{-8}$	$7.4.10^{-8}$	$5.0.10^{-4}$	$3.5.10^{-10}$
		S	$2.0.10^{-4}$	$5.9.10^{-8}$	$7.8.10^{-8}$	$2.0.10^{-4}$	$3.6.10^{-10}$
Th-227	18.718 d	M	$5.0.10^{-4}$	$7.8.10^{-6}$	$6.2.10^{-6}$	$5.0.10^{-4}$	$8.9.10^{-9}$
		S	$2.0.10^{-4}$	$9.6.10^{-6}$	$7.6.10^{-6}$	$2.0.10^{-4}$	$8.4.10^{-9}$
Th-228	1.9131 y	M	$5.0.10^{-4}$	$3.0.10^{-5}$	$2.2.10^{-5}$	$5.0.10^{-4}$	$7.2.10^{-8}$
		S	$2.0.10^{-4}$	$3.7.10^{-5}$	$2.5.10^{-5}$	$2.0.10^{-4}$	$3.5.10^{-8}$
Th-229	7340 y	M	$5.0.10^{-4}$	$9.9.10^{-5}$	$6.9.10^{-5}$	$5.0.10^{-4}$	$4.8.10^{-7}$
		S	$2.0.10^{-4}$	$6.5.10^{-5}$	$4.8.10^{-5}$	$2.0.10^{-4}$	$2.0.10^{-7}$
Th-230	$7.7.10^{4}$ y	M	$5.0.10^{-4}$	$4.0.10^{-5}$	$2.8.10^{-5}$	$5.0.10^{-4}$	$2.1.10^{-7}$
		S	$2.0.10^{-4}$	$1.3.10^{-5}$	$7.2.10^{-6}$	$2.0.10^{-4}$	$8.7.10^{-8}$
Th-231	25.52 h	M	$5.0.10^{-4}$	$2.9.10^{-10}$	$3.7.10^{-10}$	$5.0.10^{-4}$	$3.4.10^{-10}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		S	$2.0.10^{-4}$	$3.2.10^{-10}$	$4.0.10^{-10}$	$2.0.10^{-4}$	$3.4.10^{-10}$
Th-232	$1.405.10^{10}$ y	M	$5.0.10^{-4}$	$4.2.10^{-5}$	$2.9.10^{-5}$	$5.0.10^{-4}$	$2.2.10^{-7}$
		S	$2.0.10^{-4}$	$2.3.10^{-5}$	$1.2.10^{-5}$	$2.0.10^{-4}$	$9.2.10^{-8}$
Th-234	24.10 d	M	$5.0.10^{-4}$	$6.3.10^{-9}$	$5.3.10^{-9}$	$5.0.10^{-4}$	$3.4.10^{-9}$
		S	$2.0.10^{-4}$	$7.3.10^{-9}$	$5.8.10^{-9}$	$2.0.10^{-4}$	$3.4.10^{-9}$
protactinium							
Pa-227	38.3 min	M	$5.0.10^{-4}$	$7.0.10^{-8}$	$9.0.10^{-8}$	$5.0.10^{-4}$	$4.5.10^{-10}$
		S	$5.0.10^{-4}$	$7.6.10^{-8}$	$9.7.10^{-8}$		
Pa-228	22 h	M	$5.0.10^{-4}$	$5.9.10^{-8}$	$4.6.10^{-8}$	$5.0.10^{-4}$	$7.8.10^{-10}$
		S	$5.0.10^{-4}$	$6.9.10^{-8}$	$5.1.10^{-8}$		
Pa-230	17.4 d	M	$5.0.10^{-4}$	$5.6.10^{-7}$	$4.6.10^{-7}$	$5.0.10^{-4}$	$9.2.10^{-10}$
		S	$5.0.10^{-4}$	$7.1.10^{-7}$	$5.7.10^{-7}$		
Pa-231	$3.276.10^{4}$ r	M	$5.0.10^{-4}$	$1.3.10^{-4}$	$8.9.10^{-5}$	$5.0.10^{-4}$	$7.1.10^{-7}$
		S	$5.0.10^{-4}$	$3.2.10^{-5}$	$1.7.10^{-5}$		
Pa-232	1.31 d	M	$5.0.10^{-4}$	$9.5.10^{-9}$	$6.8.10^{-9}$	$5.0.10^{-4}$	$7.2.10^{-10}$
		S	$5.0.10^{-4}$	$3.2.10^{-9}$	$2.0.10^{-9}$		
Pa-233	27.0 d	M	$5.0.10^{-4}$	$3.1.10^{-9}$	$2.8.10^{-9}$	$5.0.10^{-4}$	$8.7.10^{-10}$
		S	$5.0.10^{-4}$	$3.7.10^{-9}$	$3.2.10^{-9}$		
Pa-234	6.70 h	M	$5.0.10^{-4}$	$3.8.10^{-10}$	$5.5.10^{-10}$	$5.0.10^{-4}$	$5.1.10^{-10}$
		S	$5.0.10^{-4}$	$4.0.10^{-10}$	$5.8.10^{-10}$		
uranium							
U-230	20,8 d	F	0.02	$3.6.10^{-7}$	$4.2.10^{-7}$	0.02	$5.5.10^{-8}$
		M	0.02	$1.2.10^{-5}$	$1.0.10^{-5}$	0.002	$2.8.10^{-8}$
		S	0.002	$1.5.10^{-5}$	$1.2.10^{-5}$		
U-231	4.2 d	F	0.02	$6.7.10^{-11}$	1.610^{-10}	0.02	$2.8.10^{-10}$
		M	0.02	$4.3.10^{-10}$	$4.5.10^{-10}$	0.002	$2.8.10^{-10}$
		S	0.002	$4.8.10^{-10}$	$4.9.10^{-10}$		
U-232	72 y	F	0.02	$4.0.10^{-6}$	$4.7.10^{-6}$	0.02	$3.3.10^{-7}$
		M	0.02	$7.2.10^{-6}$	$4.8.10^{-6}$	0.002	$3.7.10^{-8}$
		S	0.002	$3.5.10^{-5}$	$2.6.10^{-5}$		
U-233	$1.585.10^{5}$ y	F	0.02	$5.7.10^{-7}$	$6.6.10^{-7}$	0.02	$5.0.10^{-8}$
		M	0.02	$3.2.10^{-6}$	$2.2.10^{-6}$	0.002	$8.5.10^{-9}$
		S	0.002	$8.7.10^{-6}$	$6.9.10^{-6}$		
U-234	$2.445.10^{5}$ y	F	0.02	$5.5.10^{-7}$	$6.4.10^{-7}$	0.02	$4.9.10^{-8}$
		M	0.02	$3.1.10^{-6}$	$2.1.10^{-6}$	0.002	$8.3.10^{-9}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		S	0.002	$8.5.10^{-6}$	$6.8.10^{-6}$		
U-235	$703.8.10^{6}$ y	F	0.02	$5.1.10^{-7}$	$6.0.10^{-7}$	0.02	$4.6.10^{-8}$
		M	0.02	$2.8.10^{-6}$	$1.8.10^{-6}$	0.002	$8.3.10^{-9}$
		S	0.002	$7.7.10^{-6}$	$6.1.10^{-6}$		
U-236	$2.3415.10^{7}$ y	F	0.02	$5.2.10^{-7}$	$6.1.10^{-7}$	0.02	$4.6.10^{-8}$
		M	0.02	$2.9.10^{-6}$	$1.9.10^{-6}$	0.002	$7.9.10^{-9}$
		S	0.002	$7.9.10^{-6}$	$6.3.10^{-6}$		
U-237	6.75 d	F	0.02	$1.9.10^{-10}$	$3.3.10^{-10}$	0.02	$7.6.10^{-10}$
		M	0.02	$1.6.10^{-9}$	$1.5.10^{-9}$	0.002	$7.7.10^{-10}$
		S	0.002	$1.8.10^{-9}$	$1.7.10^{-9}$		
U-238	$4.468.10^{9}$ y	F	0.02	$4.9.10^{-7}$	$5.8.10^{-7}$	0.02	$4.4.10^{-8}$
		M	0.02	$2.6.10^{-6}$	$1.6.10^{-6}$	0.002	$7.6.10^{-9}$
		S	0.002	$7.3.10^{-6}$	$5.7.10^{-6}$		
U-239	23.54 min	F	0.02	$1.1.10^{-11}$	$1.8.10^{-11}$	0.02	$2.7.10^{-11}$
		M	0.02	$2.3.10^{-11}$	$3.3.10^{-11}$	0.002	$2.8.10^{-11}$
		S	0.002	$2.4.10^{-11}$	$3.5.10^{-11}$		
U-240	14.1 h	F	0.02	$2.1.10^{-10}$	$3.7.10^{-10}$	0.02	$1.1.10^{-9}$
		M	0.02	$5.3.10^{-10}$	$7.9.10^{-10}$	0.002	$1.1.10^{-9}$
		S	0.002	$5.7.10^{-10}$	$8.4.10^{-10}$		
neptunium							
Np-232	14.7 min	M	$5.0.10^{-4}$	$4.7.10^{-11}$	$3.5.10^{-11}$	$5.0.10^{-4}$	$9.7.10^{-12}$
Np-233	36.2 min	M	$5.0.10^{-4}$	$1.7.10^{-12}$	$3.0.10^{-12}$	$5.0.10^{-4}$	$2.2.10^{-12}$
Np-234	4.4 d	M	$5.0.10^{-4}$	$5.4.10^{-10}$	$7.3.10^{-10}$	$5.0.10^{-4}$	$8.1.10^{-10}$
Np-235	396.1 d	M	$5.0.10^{-4}$	$4.0.10^{-10}$	$2.7.10^{-10}$	$5.0.10^{-4}$	$5.3.10^{-11}$
Np-236	115.10^{3} y	M	$5.0.10^{-4}$	$3.0.10^{-6}$	$2.0.10^{-6}$	$5.0.10^{-4}$	$1.7.10^{-8}$
Np-236m	22.5 h	M	$5.0.10^{-4}$	$5.0.10^{-9}$	$3.6.10^{-9}$	$5.0.10^{-4}$	$1.9.10^{-10}$
Np-237	$2.14.10^{6}$ y	M	$5.0.10^{-4}$	$2.1.10^{-5}$	$1.5.10^{-5}$	$5.0.10^{-4}$	$1.1.10^{-7}$
Np-238	2.117 d	M	$5.0.10^{-4}$	$2.0.10^{-9}$	$1.7.10^{-9}$	$5.0.10^{-4}$	$9.1.10^{-10}$
Np-239	2.355 d	M	$5.0.10^{-4}$	$9.0.10^{-10}$	$1.1.10^{-9}$	$5.0.10^{-4}$	$8.0.10^{-10}$
Np-240	65 min	M	$5.0.10^{-4}$	$8.7.10^{-11}$	$1.3.10^{-10}$	$5.0.10^{-4}$	$8.2.10^{-11}$
plutonium							
Pu-234	8.8 h	M	$5.0.10^{-4}$	$1.9.10^{-8}$	$1.6.10^{-8}$	$5.0.10^{-4}$	$1.6.10^{-10}$
		S	$1.0.10^{-5}$	$2.2.10^{-8}$	$1.8.10^{-8}$	$1.0.10^{-4}$	$1.6.10^{-10}$
						$1.0.10^{-5}$	$1.5.10^{-10}$
Pu-235	25.3 min	M	$5.0.10^{-4}$	$1.5.10^{-12}$	$2.5.10^{-12}$	$5.0.10^{-4}$	$2.1.10^{-12}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
		S	$1.0.10^{-5}$	$1.6.10^{-12}$	$2.6.10^{-12}$	$1.0.10^{-4}$	$2.1.10^{-12}$
						$1.0.10^{-5}$	$2.1.10^{-12}$
Pu-236	2,851 y	M	$5.0.10^{-4}$	$1.8.10^{-5}$	$1.3.10^{-5}$	$5.0.10^{-4}$	$8.6.10^{-8}$
		S	$1.0.10^{-5}$	$9.6.10^{-6}$	$7.4.10^{-6}$	$1.0.10^{-4}$	$2.1.10^{-8}$
						$1.0.10^{-5}$	$6.3.10^{-9}$
Pu-237	45.3 d	M	$5.0.10^{-4}$	$3.3.10^{-10}$	$2.9.10^{-10}$	$5.0.10^{-4}$	$1.0.10^{-10}$
		S	$1.0.10^{-5}$	$3.6.10^{-10}$	$3.0.10^{-10}$	$1.0.10^{-4}$	$1.0.10^{-10}$
						$1.0.10^{-5}$	$1.0.10^{-10}$
Pu-238	87.74 y	M	$5.0.10^{-4}$	$4.3.10^{-5}$	$3.0.10^{-5}$	$5.0.10^{-4}$	$2.3.10^{-7}$
		S	$1.0.10^{-5}$	$1.5.10^{-5}$	$1.1.10^{-5}$	$1.0.10^{-4}$	$4.9.10^{-8}$
						$1.0.10^{-5}$	$8.8.10^{-9}$
Pu-239	24065 y	M	$5.0.10^{-4}$	$4.7.10^{-5}$	$3.2.10^{-5}$	$5.0.10^{-4}$	$2.5.10^{-7}$
		S	$1.0.10^{-5}$	$1.5.10^{-5}$	$8.3.10^{-6}$	$1.0.10^{-4}$	$5.3.10^{-8}$
						$1.0.10^{-5}$	$9.0.10^{-9}$
Pu-240	6537 y	M	$5.0.10^{-4}$	$4.7.10^{-5}$	$3.2.10^{-5}$	$5.0.10^{-4}$	$2.5.10^{-7}$
		S	$1.0.10^{-5}$	$1.5.10^{-5}$	$8.3.10^{-6}$	$1.0.10^{-4}$	$5.3.10^{-8}$
						$1.0.10^{-5}$	$9.0.10^{-9}$
Pu-241	14.4 y	M	$5.0.10^{-4}$	$8.5.10^{-7}$	$5.8.10^{-7}$	$5.0.10^{-4}$	$4.7.10^{-9}$
		S	$1.0.10^{-5}$	$1.6.10^{-7}$	$8.4.10^{-8}$	$1.0.10^{-4}$	$9.6.10^{-10}$
						$1.0.10^{-5}$	$1.1.10^{-10}$
Pu-242	$3.763.10^{5}$ y	M	$5.0.10^{-4}$	$4.4.10^{-5}$	$3.1.10^{-5}$	$5.0.10^{-4}$	$2.4.10^{-7}$
		S	$1.0.10^{-5}$	$1.4.10^{-5}$	$7.7.10^{-6}$	$1.0.10^{-4}$	$5.0.10^{-8}$
						$1.0.10^{-5}$	$8.6.10^{-9}$
Pu-243	4.956 h	M	$5.0.10^{-4}$	$8.2.10^{-11}$	$1.1.10^{-10}$	$5.0.10^{-4}$	$8.5.10^{-11}$
		S	$1.0.10^{-5}$	$8.5.10^{-11}$	$1.1.10^{-10}$	$1.0.10^{-4}$	$8.5.10^{-11}$
						$1.0.10^{-5}$	$8.5.10^{-11}$
Pu-244	$8.26.10^{7}$ y	M	$5.0.10^{-4}$	$4.4.10^{-5}$	$3.0.10^{-5}$	$5.0.10^{-4}$	$2.4.10^{-7}$
		S	$1.0.10^{-5}$	$1.3.10^{-5}$	$7.4.10^{-6}$	$1.0.10^{-4}$	$5.2.10^{-8}$
						$1.0.10^{-5}$	$1.1.10^{-8}$
Pu-245	10,5 h	M	$5.0.10^{-4}$	$4.5.10^{-10}$	$6.1.10^{-10}$	$5.0.10^{-4}$	$7.2.10^{-10}$
		S	$1.0.10^{-5}$	$4.8.10^{-10}$	$6.5.10^{-10}$	$1.0.10^{-4}$	$7.2.10^{-10}$
						$1.0.10^{-5}$	$7.2.10^{-10}$
Pu-246	10,85 d	M	$5.0.10^{-4}$	$7.0.10^{-9}$	$6.5.10^{-9}$	$5.0.10^{-4}$	$3.3.10^{-9}$
		S	$1.0.10^{-5}$	$7.6.10^{-9}$	$7.0.10^{-9}$	$1.0.10^{-4}$	$3.3.10^{-9}$
						$1.0.10^{-5}$	$3.3.10^{-9}$

Element		Inhalation				Ingestion	
nuclide	$T_{½}$	type	f_1	h_{inh} [Sv/Bq] d_{ama} = 1 µm	h_{inh} [Sv/Bq] d_{ama} = 5 µm	f_1	h_{ing} [Sv/Bq]
americium							
Am-237	73.0 min	M	$5.0.10^{-4}$	$2.5.10^{-11}$	$3.6.10^{-11}$	$5.0.10^{-4}$	$1.8.10^{-11}$
Am-238	98 min	M	$5.0.10^{-4}$	$8.5.10^{-11}$	$6.6.10^{-11}$	$5.0.10^{-4}$	$3.2.10^{-11}$
Am-239	11.9 h	M	$5.0.10^{-4}$	$2.2.10^{-10}$	$2.9.10^{-10}$	$5.0.10^{-4}$	$2.4.10^{-10}$
Am-240	50,8 h	M	$5.0.10^{-4}$	$4.4.10^{-10}$	$5.9.10^{-10}$	$5.0.10^{-4}$	$5.8.10^{-10}$
Am-241	432.2 y	M	$5.0.10^{-4}$	$3.9.10^{-5}$	$2.7.10^{-5}$	$5.0.10^{-4}$	$2.0.10^{-7}$
Am-242	16.02 h	M	$5.0.10^{-4}$	$1.6.10^{-8}$	$1.2.10^{-8}$	$5.0.10^{-4}$	$3.0.10^{-10}$
Am-242m	152 y	M	$5.0.10^{-4}$	$3.5.10^{-5}$	$2.4.10^{-5}$	$5.0.10^{-4}$	$1.9.10^{-7}$
Am-243	7380 y	M	$5.0.10^{-4}$	$3.9.10^{-5}$	$2.7.10^{-5}$	$5.0.10^{-4}$	$2.0.10^{-7}$
Am-244	10.1 h	M	$5.0.10^{-4}$	$1.9.10^{-9}$	$1.5.10^{-9}$	$5.0.10^{-4}$	$4.6.10^{-10}$
Am-244m	26 min	M	$5.0.10^{-4}$	$7.9.10^{-11}$	$6.2.10^{-11}$	$5.0.10^{-4}$	$2.9.10^{-11}$
Am-245	2.05 h	M	$5.0.10^{-4}$	$5.3.10^{-11}$	$7.6.10^{-11}$	$5.0.10^{-4}$	$6.2.10^{-11}$
Am-246	39 min	M	$5.0.10^{-4}$	$6.8.10^{-11}$	$1.1.10^{-10}$	$5.0.10^{-4}$	$5.8.10^{-11}$
Am-246m	25.0 min	M	$5.0.10^{-4}$	$2.3.10^{-11}$	$3.8.10^{-11}$	$5.0.10^{-4}$	$3.4.10^{-11}$
curium							
Cm-238	2.4 h	M	$5.0.10^{-4}$	$4.1.10^{-9}$	$4.8.10^{-9}$	$5.0.10^{-4}$	$8.0.10^{-11}$
Cm-240	27 d	M	$5.0.10^{-4}$	$2.9.10^{-6}$	$2.3.10^{-6}$	$5.0.10^{-4}$	$7.6.10^{-9}$
Cm-241	32,8 d	M	$5.0.10^{-4}$	$3.4.10^{-8}$	$2.6.10^{-8}$	$5.0.10^{-4}$	$9.1.10^{-10}$
Cm-242	162,8 d	M	$5.0.10^{-4}$	$4.8.10^{-6}$	$3.7.10^{-6}$	$5.0.10^{-4}$	$1.2.10^{-8}$
Cm-243	28.5 y	M	$5.0.10^{-4}$	$2.9.10^{-5}$	$2.0.10^{-5}$	$5.0.10^{-4}$	$1.5.10^{-7}$
Cm-244	18.11 y	M	$5.0.10^{-4}$	$2.5.10^{-5}$	$1.7.10^{-5}$	$5.0.10^{-4}$	$1.2.10^{-7}$
Cm-245	8500 y	M	$5.0.10^{-4}$	$4.0.10^{-5}$	$2.7.10^{-5}$	$5.0.10^{-4}$	$2.1.10^{-7}$
Cm-246	4730 y	M	$5.0.10^{-4}$	$4.0.10^{-5}$	$2.7.10^{-5}$	$5.0.10^{-4}$	$2.1.10^{-7}$
Cm-247	$1.56.10^{7}$ y	M	$5.0.10^{-4}$	$3.6.10^{-5}$	$2.5.10^{-5}$	$5.0.10^{-4}$	$1.9.10^{-7}$
Cm-248	$3.39.10^{5}$ y	M	$5.0.10^{-4}$	$1.4.10^{-4}$	$9.5.10^{-5}$	$5.0.10^{-4}$	$7.7.10^{-7}$
Cm-249	64.15 min	M	$5.0.10^{-4}$	$3.2.10^{-11}$	$5.1.10^{-11}$	$5.0.10^{-4}$	$3.1.10^{-11}$
Cm-250	6900 y	M	$5.0.10^{-4}$	$7.9.10^{-4}$	$5.4.10^{-4}$	$5.0.10^{-4}$	$4.4.10^{-6}$
berkelium							
Bk-245	4.94 d	M	$5.0.10^{-4}$	$2.0.10^{-9}$	$1.8.10^{-9}$	$5.0.10^{-4}$	$5.7.10^{-10}$
Bk-246	1.83 d	M	$5.0.10^{-4}$	$3.4.10^{-10}$	$4.6.10^{-10}$	$5.0.10^{-4}$	$4.8.10^{-10}$
Bk-247	1380 y	M	$5.0.10^{-4}$	$6.5.10^{-5}$	$4.5.10^{-5}$	$5.0.10^{-4}$	$3.5.10^{-7}$
Bk-249	320 d	M	$5.0.10^{-4}$	$1.5.10^{-7}$	$1.0.10^{-7}$	$5.0.10^{-4}$	$9.7.10^{-10}$
Bk-250	3.222 h	M	$5.0.10^{-4}$	$9.6.10^{-10}$	$7.1.10^{-10}$	$5.0.10^{-4}$	$1.4.10^{-10}$
californium							
Cf-244	19.4 min	M	$5.0.10^{-4}$	$1.3.10^{-8}$	$1.8.10^{-8}$	$5.0.10^{-4}$	$7.0.10^{-11}$

Element		**Inhalation**				**Ingestion**	
nuclide	$T_{½}$	**typ e**	f_1	h_{inh} **[Sv/Bq]**		f_1	h_{ing} **[Sv/Bq]**
				d_{ama} = 1 µm	d_{ama} = 5 µm		
Cf-246	35.7 h	M	$5.0.10^{-4}$	$4.2.10^{-7}$	$3.5.10^{-7}$	$5.0.10^{-4}$	$3.3.10^{-9}$
Cf-248	333.5 d	M	$5.0.10^{-4}$	$8.2.10^{-6}$	$6.1.10^{-6}$	$5.0.10^{-4}$	$2.8.10^{-8}$
Cf-249	350,6 y	M	$5.0.10^{-4}$	$6.6.10^{-5}$	$4.5.10^{-5}$	$5.0.10^{-4}$	$3.5.10^{-7}$
Cf-250	13.08 y	M	$5.0.10^{-4}$	$3.2.10^{-5}$	$2.2.10^{-5}$	$5.0.10^{-4}$	$1.6.10^{-7}$
Cf-251	898 y	M	$5.0.10^{-4}$	$6.7.10^{-5}$	$4.6.10^{-5}$	$5.0.10^{-4}$	$3.6.10^{-7}$
Cf-252	2.638 y	M	$5.0.10^{-4}$	$1.8.10^{-5}$	$1.3.10^{-5}$	$5.0.10^{-4}$	$9.0.10^{-8}$
Cf-253	17.81 d	M	$5.0.10^{-4}$	$1.2.10^{-6}$	$1.0.10^{-6}$	$5.0.10^{-4}$	$1.4.10^{-9}$
Cf-254	60,5 d	M	$5.0.10^{-4}$	$3.7.10^{-5}$	$2.2.10^{-5}$	$5.0.10^{-4}$	$4.0.10^{-7}$
einsteinium							
Es-250m	2.1 h	M	$5.0.10^{-4}$	$5.9.10^{-10}$	$4.2.10^{-10}$	$5.0.10^{-4}$	$2.1.10^{-11}$
Es-251	33 h	M	$5.0.10^{-4}$	$2.0.10^{-9}$	$1.7.10^{-9}$	$5.0.10^{-4}$	$1.7.10^{-10}$
Es-253	20,47 d	M	$5.0.10^{-4}$	$2.5.10^{-6}$	$2.1.10^{-6}$	$5.0.10^{-4}$	$6.1.10^{-9}$
Es-254	275.7 d	M	$5.0.10^{-4}$	$8.0.10^{-6}$	$6.0.10^{-6}$	$5.0.10^{-4}$	$2.8.10^{-8}$
Es-254m	39.3 h	M	$5.0.10^{-4}$	$4.4.10^{-7}$	$3.7.10^{-7}$	$5.0.10^{-4}$	$4.2.10^{-9}$
fermium							
Fm-252	22.7 h	M	$5.0.10^{-4}$	$3.0.10^{-7}$	$2.6.10^{-7}$	$5.0.10^{-4}$	$2.7.10^{-9}$
Fm-253	3.00 d	M	$5.0.10^{-4}$	$3.7.10^{-7}$	$3.0.10^{-7}$	$5.0.10^{-4}$	$9.1.10^{-10}$
Fm-254	3.240 h	M	$5.0.10^{-4}$	$5.6.10^{-8}$	$7.7.10^{-8}$	$5.0.10^{-4}$	$4.4.10^{-10}$
Fm-255	20.07 h	M	$5.0.10^{-4}$	$2.5.10^{-7}$	$2.6.10^{-7}$	$5.0.10^{-4}$	$2.5.10^{-9}$
Fm-257	100,5 d	M	$5.0.10^{-4}$	$6.6.10^{-6}$	$5.2.10^{-6}$	$5.0.10^{-4}$	$1.5.10^{-8}$
mendelevium							
Md-257	5.2 h	M	$5.0.10^{-4}$	$2.3.10^{-8}$	$2.0.10^{-8}$	$5.0.10^{-4}$	$1.2.10^{-10}$
Md-258	55 d	M	$5.0.10^{-4}$	$5.5.10^{-6}$	$4.4.10^{-6}$	$5.0.10^{-4}$	$1.3.10^{-8}$

Legend:

inorg.- inorganic compounds
org.- organic compounds

Conversion factors h_{inh} for intake via inhalation of radioactive aerosols or h_{ing} for intake via ingestion serve for conversion of radionuclide intake to the committed effective dose for inhalation of radioactive aerosols or for ingestion of a radioactive substance by a radiation worker.
Conversion factors h_{inh} for intake via inhalation are provided for an aerosol with d_{ama}=1 mm and for an aerosol with d_{ama}=5 mm depending on the absorption type in the lungs (F, M, S).
Conversion factors h_{ing} for intake via ingestion are provided depending on the absorption type in the digestive tract.
For unidentified radionuclides and chemical forms of radioactive substances or characteristics of inhaled aerosol, activity is attributed to those radionuclides and their forms or such an aerosol for which the table stipulates the highest conversion factor.

Conversion factors h_{ing} for intake via ingestion by an individual from the population

Element		f_1	h_{ing}[Sv/Bq]	f_1	h_{ing} [Sv/Bq]				
Nuclide		age < 1 year		≥ 1 year	1 year	5 years	10 years	15 years	adult
hydrogen									
H-3	tritiated water	1.0	$6.4.10^{-11}$	1.0	$4.8.10^{-11}$	$3.1.10^{-11}$	$2.3.10^{-11}$	$1.8.10^{-11}$	$1.8.10^{-11}$
H-3	organically bound	1.0	$1.2.10^{-10}$	1.0	$1.2.10^{-10}$	$7.3.10^{-11}$	$5.7.10^{-11}$	$4.2.10^{-11}$	$4.2.10^{-11}$
beryllium									
Be-7		0.02	$1.8.10^{-10}$	0.005	$1.3.10^{-10}$	$7.7.10^{-11}$	$5.3.10^{-11}$	$3.5.10^{-11}$	$2.8.10^{-11}$
Be-10		0.02	$1.4.10^{-8}$	0.005	$8.0.10^{-9}$	$4.1.10^{-9}$	$2.4.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
carbon									
C-11		1.0	$2.6.10^{-10}$	1.0	$1.5.10^{-10}$	$7.3.10^{-11}$	$4.3.10^{-11}$	$3.0.10^{-11}$	$2.4.10^{-11}$
C-14		1.0	$1.4.10^{-9}$	1.0	$1.6.10^{-9}$	$9.9.10^{-10}$	$8.0.10^{-10}$	$5.7.10^{-10}$	$5.8.10^{-10}$
fluorine									
F-18		1.0	$5.2.10^{-10}$	1.0	$3.0.10^{-10}$	$1.5.10^{-10}$	$9.1.10^{-11}$	$6.2.10^{-11}$	$4.9.10^{-11}$
sodium									
Na-22		1.0	$2.1.10^{-8}$	1.0	$1.5.10^{-8}$	$8.4.10^{-9}$	$5.5.10^{-9}$	$3.7.10^{-9}$	$3.2.10^{-9}$
Na-24		1.0	$3.5.10^{-9}$	1.0	$2.3.10^{-9}$	$1.2.10^{-9}$	$7.7.10^{-10}$	$5.2.10^{-10}$	$4.3.10^{-10}$
magnesium									
Mg-28		1.0	$1.2.10^{-8}$	0.5	$1.4.10^{-8}$	$7.4.10^{-9}$	$4.5.10^{-9}$	$2.7.10^{-9}$	$2.2.10^{-9}$
aluminium									
Al-26		0.02	$3.4.10^{-8}$	0.01	$2.1.10^{-8}$	$1.1.10^{-8}$	$7.1.10^{-9}$	$4.3.10^{-9}$	$3.5.10^{-9}$
silicon									
Si-31		0.02	$1.9.10^{-9}$	0.01	$1.0.10^{-9}$	$5.1.10^{-10}$	$3.0.10^{-10}$	$1.8.10^{-10}$	$1.6.10^{-10}$
Si-32		0.02	$7.3.10^{-9}$	0.01	$4.1.10^{-9}$	$2.0.10^{-9}$	$1.2.10^{-9}$	$7.0.10^{-10}$	$5.6.10^{-10}$
phosphorus									
P-32		1.0	$3.1.10^{-8}$	0.8	$1.9.10^{-8}$	$9.4.10^{-9}$	$5.3.10^{-9}$	$3.1.10^{-9}$	$2.4.10^{-9}$
P-33		1.0	$2.7.10^{-9}$	0.8	$1.8.10^{-9}$	$9.1.10^{-10}$	$5.3.10^{-10}$	$3.1.10^{-10}$	$2.4.10^{-10}$
sulphur									
S-35	inorganic	1.0	$1.3.10^{-9}$	1.0	$8.7.10^{-10}$	$4.4.10^{-10}$	$2.7.10^{-10}$	$1.6.10^{-10}$	$1.3.10^{-10}$
S-35	organic	1.0	$7.7.10^{-9}$	1.0	$5.4.10^{-9}$	$2.7.10^{-9}$	$1.6.10^{-9}$	$9.5.10^{-10}$	$7.7.10^{-10}$
chlorine									
Cl-36		1.0	$9.8.10^{-9}$	1.0	$6.3.10^{-9}$	$3.2.10^{-9}$	$1.9.10^{-9}$	$1.2.10^{-9}$	$9.3.10^{-10}$
Cl-38		1.0	$1.4.10^{-9}$	1.0	$7.7.10^{-10}$	$3.8.10^{-10}$	$2.2.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
Cl-39		1.0	$9.7.10^{-10}$	1.0	$5.5.10^{-10}$	$2.7.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$8.5.10^{-11}$
potassium									
K-40		1.0	$6.2.10^{-8}$	1.0	$4.2.10^{-8}$	$2.1.10^{-8}$	$1.3.10^{-8}$	$7.6.10^{-9}$	$6.2.10^{-9}$

Element		f_1	h_{ing}[Sv/Bq]	f_1	h_{ing} [Sv/Bq]				
Nuclide		**age < 1 year**		**≥ 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
K-42		1.0	$5.1.10^{-9}$	1.0	$3.0.10^{-9}$	$1.5.10^{-9}$	$8.6.10^{-10}$	$5.4.10^{-10}$	$4.3.10^{-10}$
K-43		1.0	$2.3.10^{-9}$	1.0	$1.4.10^{-9}$	$7.6.10^{-10}$	$4.7.10^{-10}$	$3.0.10^{-10}$	$2.5.10^{-10}$
K-44		1.0	$1.0.10^{-9}$	1.0	$5.5.10^{-10}$	$2.7.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$8.4.10^{-11}$
K-45		1.0	$6.2.10^{-10}$	1.0	$3.5.10^{-10}$	$1.7.10^{-10}$	$9.9.10^{-11}$	$6.8.10^{-11}$	$5.4.10^{-11}$
calcium									
Ca-41		0.6	$1.2.10^{-9}$	0.4^{X}	$5.2.10^{-10}$	$3.9.10^{-10}$	$4.8.10^{-10}$	$5.0.10^{-10}$	$1.9.10^{-10}$
Ca-45		0.6	$1.1.10^{-8}$	0.4^{X}	$4.9.10^{-9}$	$2.6.10^{-9}$	$1.8.10^{-9}$	$1.3.10^{-9}$	$7.1.10^{-10}$
Ca-47		0.6	$1.3.10^{-8}$	0.4^{X}	$9.3.10^{-9}$	$4.9.10^{-9}$	$3.0.10^{-9}$	$1.8.10^{-9}$	$1.6.10^{-9}$
scandium									
Sc-43		0.001	$1.8.10^{-9}$	$1.0.10^{-4}$	$1.2.10^{-9}$	$6.1.10^{-10}$	$3.7.10^{-10}$	$2.3.10^{-10}$	$1.9.10^{-10}$
Sc-44		0.001	$3.5.10^{-9}$	$1.0.10^{-4}$	$2.2.10^{-9}$	$1.2.10^{-9}$	$7.1.10^{-10}$	$4.4.10^{-10}$	$3.5.10^{-10}$
Sc-44m		0.001	$2.4.10^{-8}$	$1.0.10^{-4}$	$1.6.10^{-8}$	$8.3.10^{-9}$	$5.1.10^{-9}$	$3.1.10^{-9}$	$2.4.10^{-9}$
Sc-46		0.001	$1.1.10^{-8}$	$1.0.10^{-4}$	$7.9.10^{-9}$	$4.4.10^{-9}$	$2.9.10^{-9}$	$1.8.10^{-9}$	$1.5.10^{-9}$
Sc-47		0.001	$6.1.10^{-9}$	$1.0.10^{-4}$	$3.9.10^{-9}$	$2.0.10^{-9}$	$1.2.10^{-9}$	$6.8.10^{-10}$	$5.4.10^{-10}$
Sc-48		0.001	$1.3.10^{-8}$	$1.0.10^{-4}$	$9.3.10^{-9}$	$5.1.10^{-9}$	$3.3.10^{-9}$	$2.1.10^{-9}$	$1.7.10^{-9}$
Sc-49		0.001	$1.0.10^{-9}$	$1.0.10^{-4}$	$5.7.10^{-10}$	$2.8.10^{-10}$	$1.6.10^{-10}$	$1.0.10^{-10}$	$8.2.10^{-11}$
titanium									
Ti-44		0.02	$5.5.10^{-8}$	0.01	$3.1.10^{-8}$	$1.7.10^{-8}$	$1.1.10^{-8}$	$6.9.10^{-9}$	$5.8.10^{-9}$
Ti-45		0.02	$1.6.10^{-9}$	0.01	$9.8.10^{-10}$	$5.0.10^{-10}$	$3.1.10^{-10}$	$1.9.10^{-10}$	$1.5.10^{-10}$
vanadium									
V-47		0.02	$7.3.10^{-10}$	0.01	$4.1.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$8.0.10^{-11}$	$6.3.10^{-11}$
V-48		0.02	$1.5.10^{-8}$	0.01	$1.1.10^{-8}$	$5.9.10^{-9}$	$3.9.10^{-9}$	$2.5.10^{-9}$	$2.0.10^{-9}$
V-49		0.02	$2.2.10^{-10}$	0.01	$1.4.10^{-10}$	$6.9.10^{-11}$	$4.0.10^{-11}$	$2.3.10^{-11}$	$1.8.10^{-11}$
chromium									
Cr-48		0.2	$1.4.10^{-9}$	0.1	$9.9.10^{-10}$	$5.7.10^{-10}$	$3.8.10^{-10}$	$2.5.10^{-10}$	$2.0.10^{-10}$
		0.02	$1.4.10^{-9}$	0.01	$9.9.10^{-10}$	$5.7.10^{-10}$	$3.8.10^{-10}$	$2.5.10^{-10}$	$2.0.10^{-10}$
Cr-49		0.2	$6.8.10^{-10}$	0.1	$3.9.10^{-10}$	$2.0.10^{-10}$	$1.1.10^{-10}$	$7.7.10^{-11}$	$6.1.10^{-11}$
		0.02	$6.8.10^{-10}$	0.01	$3.9.10^{-10}$	$2.0.10^{-10}$	$1.1.10^{-10}$	$7.7.10^{-11}$	$6.1.10^{-11}$
Cr-51		0.2	$3.5.10^{-10}$	0.1	$2.3.10^{-10}$	$1.2.10^{-10}$	$7.8.10^{-11}$	$4.8.10^{-11}$	$3.8.10^{-11}$
		0.02	$3.3.10^{-10}$	0.01	$2.2.10^{-10}$	$1.2.10^{-10}$	$7.5.10^{-11}$	$4.6.10^{-11}$	$3.7.10^{-11}$
manganese									
Mn-51		0.2	$1.1.10^{-9}$	0.1	$6.1.10^{-10}$	$3.0.10^{-10}$	$1.8.10^{-10}$	$1.2.10^{-10}$	$9.3.10^{-11}$
Mn-52		0.2	$1.2.10^{-8}$	0.1	$8.8.10^{-9}$	$5.1.10^{-9}$	$3.4.10^{-9}$	$2.2.10^{-9}$	$1.8.10^{-9}$
Mn-52m		0.2	$7.8.10^{-10}$	0.1	$4.4.10^{-10}$	$2.2.10^{-10}$	$1.3.10^{-10}$	$8.8.10^{-11}$	$6.9.10^{-11}$
Mn-53		0.2	$4.1.10^{-10}$	0.1	$2.2.10^{-10}$	$1.1.10^{-10}$	$6.5.10^{-11}$	$3.7.10^{-11}$	$3.0.10^{-11}$
Mn-54		0.2	$5.4.10^{-9}$	0.1	$3.1.10^{-9}$	$1.9.10^{-9}$	$1.3.10^{-9}$	$8.7.10^{-10}$	$7.1.10^{-10}$

Element		**f_1**	**h_{ing}[Sv/Bq]**	**f_1**	**h_{ing} [Sv/Bq]**				
Nuclide		**age < 1 year**		**≥ 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Mn-56		0.2	$2.7.10^{-9}$	0.1	$1.7.10^{-9}$	$8.5.10^{-10}$	$5.1.10^{-10}$	$3.2.10^{-10}$	$2.5.10^{-10}$
iron									
Fe-52		0.6	$1.3.10^{-8}$	0.2*	$9.1.10^{-9}$	$4.6.10^{-9}$	$2.8.10^{-9}$	$1.7.10^{-9}$	$1.4.10^{-9}$
Fe-55		0.6	$7.6.10^{-9}$	0.2*	$2.4.10^{-9}$	$1.7.10^{-9}$	$1.1.10^{-9}$	$7.7.10^{-10}$	$3.3.10^{-10}$
Fe-59		0.6	$3.9.10^{-8}$	0.2*	$1.3.10^{-8}$	$7.5.10^{-9}$	$4.7.10^{-9}$	$3.1.10^{-9}$	$1.8.10^{-9}$
Fe-60		0.6	$7.9.10^{-7}$	0.2*	$2.7.10^{-7}$	$2.7.10^{-7}$	$2.5.10^{-7}$	$2.3.10^{-7}$	$1.1.10^{-7}$
cobalt									
Co-55		0.6	$6.0.10^{-9}$	0.3*	$5.5.10^{-9}$	$2.9.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$1.0.10^{-9}$
Co-56		0.6	$2.5.10^{-8}$	0.3*	$1.5.10^{-8}$	$8.8.10^{-9}$	$5.8.10^{-9}$	$3.8.10^{-9}$	$2.5.10^{-9}$
Co-57		0.6	$2.9.10^{-9}$	0.3*	$1.6.10^{-9}$	$8.9.10^{-10}$	$5.8.10^{-10}$	$3.7.10^{-10}$	$2.1.10^{-10}$
Co-58		0.6	$7.3.10^{-9}$	0.3*	$4.4.10^{-9}$	$2.6.10^{-9}$	$1.7.10^{-9}$	$1.1.10^{-9}$	$7.4.10^{-10}$
Co-58m		0.6	$2.0.10^{-10}$	0.3*	$1.5.10^{-10}$	$7.8.10^{-11}$	$4.7.10^{-11}$	$2.8.10^{-11}$	$2.4.10^{-11}$
Co-60		0.6	$5.4.10^{-8}$	0.3*	$2.7.10^{-8}$	$1.7.10^{-8}$	$1.1.10^{-8}$	$7.9.10^{-9}$	$3.4.10^{-9}$
Co-60m		0.6	$2.2.10^{-11}$	0.3*	$1.2.10^{-11}$	$5.7.10^{-12}$	$3.2.10^{-12}$	$2.2.10^{-12}$	$1.7.10^{-12}$
Co-61		0.6	$8.2.10^{-10}$	0.3*	$5.1.10^{-10}$	$2.5.10^{-10}$	$1.4.10^{-10}$	$9.2.10^{-11}$	$7.4.10^{-11}$
Co-62m		0.6	$5.3.10^{-10}$	0.3*	$3.0.10^{-10}$	$1.5.10^{-10}$	$8.7.10^{-11}$	$6.0.10^{-11}$	$4.7.10^{-11}$
nickel									
Ni-56		0.1	$5.3.10^{-9}$	0.05	$4.0.10^{-9}$	$2.3.10^{-9}$	$1.6.10^{-9}$	$1.1.10^{-9}$	$8.6.10^{-10}$
Ni-57		0.1	$6.8.10^{-9}$	0.05	$4.9.10^{-9}$	$2.7.10^{-9}$	$1.7.10^{-9}$	$1.1.10^{-9}$	$8.7.10^{-10}$
Ni-59		0.1	$6.4.10^{-10}$	0.05	$3.4.10^{-10}$	$1.9.10^{-10}$	$1.1.10^{-10}$	$7.3.10^{-11}$	$6.3.10^{-11}$
Ni-63		0.1	$1.6.10^{-9}$	0.05	$8.4.10^{-10}$	$4.6.10^{-10}$	$2.8.10^{-10}$	$1.8.10^{-10}$	$1.5.10^{-10}$
Ni-65		0.1	$2.1.10^{-9}$	0.05	$1.3.10^{-9}$	$6.3.10^{-10}$	$3.8.10^{-10}$	$2.3.10^{-10}$	$1.8.10^{-10}$
Ni-66		0.1	$3.3.10^{-8}$	0.05	$2.2.10^{-8}$	$1.1.10^{-8}$	$6.6.10^{-9}$	$3.7.10^{-9}$	$3.0.10^{-9}$
copper									
Cu-60		1.0	$7.0.10^{-10}$	0.5	$4.2.10^{-10}$	$2.2.10^{-10}$	$1.3.10^{-10}$	$8.9.10^{-11}$	$7.0.10^{-11}$
Cu-61		1.0	$7.1.10^{-10}$	0.5	$7.5.10^{-10}$	$3.9.10^{-10}$	$2.3.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
Cu-64		1.0	$5.2.10^{-10}$	0.5	$8.3.10^{-10}$	$4.2.10^{-10}$	$2.5.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
Cu-67		1.0	$2.1.10^{-9}$	0.5	$2.4.10^{-9}$	$1.2.10^{-9}$	$7.2.10^{-10}$	$4.2.10^{-10}$	$3.4.10^{-10}$
zinc									
Zn-62		1.0	$4.2.10^{-9}$	0.5	$6.5.10^{-9}$	$3.3.10^{-9}$	$2.0.10^{-9}$	$1.2.10^{-9}$	$9.4.10^{-10}$
Zn-63		1.0	$8.7.10^{-10}$	0.5	$5.2.10^{-10}$	$2.6.10^{-10}$	$1.5.10^{-10}$	$1.0.10^{-10}$	$7.9.10^{-11}$
Zn-65		1.0	$3.6.10^{-8}$	0.5	$1.6.10^{-8}$	$9.7.10^{-9}$	$6.4.10^{-9}$	$4.5.10^{-9}$	$3.9.10^{-9}$
Zn-69		1.0	$3.5.10^{-10}$	0.5	$2.2.10^{-10}$	$1.1.10^{-10}$	$6.0.10^{-11}$	$3.9.10^{-11}$	$3.1.10^{-11}$
Zn-69m		1.0	$1.3.10^{-9}$	0.5	$2.3.10^{-9}$	$1.2.10^{-9}$	$7.0.10^{-10}$	$4.1.10^{-10}$	$3.3.10^{-10}$
Zn-71m		1.0	$1.4.10^{-9}$	0.5	$1.5.10^{-9}$	$7.8.10^{-10}$	$4.8.10^{-10}$	$3.0.10^{-10}$	$2.4.10^{-10}$
Zn-72		1.0	$8.7.10^{-9}$	0.5	$8.6.10^{-9}$	$4.5.10^{-9}$	$2.8.10^{-9}$	$1.7.10^{-9}$	$1.4.10^{-9}$

Element		**f$_1$**	**h$_{ing}$[Sv/Bq]**	**f$_1$**	**h$_{ing}$ [Sv/Bq]**				
Nuclide		**age < 1 year**		**≥ 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
gallium									
Ga-65		0.01	$4.3.10^{-10}$	0.001	$2.4.10^{-10}$	$1.2.10^{-10}$	$6.9.10^{-11}$	$4.7.10^{-11}$	$3.7.10^{-11}$
Ga-66		0.01	$1.2.10^{-8}$	0.001	$7.9.10^{-9}$	$4.0.10^{-9}$	$2.5.10^{-9}$	$1.5.10^{-9}$	$1.2.10^{-9}$
Ga-67		0.01	$1.8.10^{-9}$	0.001	$1.2.10^{-9}$	$6.4.10^{-10}$	$4.0.10^{-10}$	$2.4.10^{-10}$	$1.9.10^{-10}$
Ga-68		0.01	$1.2.10^{-9}$	0.001	$6.7.10^{-10}$	$3.4.10^{-10}$	$2.0.10^{-10}$	$1.3.10^{-10}$	$1.0.10^{-10}$
Ga-70		0.01	$3.9.10^{-10}$	0.001	$2.2.10^{-10}$	$1.0.10^{-10}$	$5.9.10^{-11}$	$4.0.10^{-11}$	$3.1.10^{-11}$
Ga-72		0.01	$1.0.10^{-8}$	0.001	$6.8.10^{-9}$	$3.6.10^{-9}$	$2.2.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
Ga-73		0.01	$3.0.10^{-9}$	0.001	$1.9.10^{-9}$	$9.3.10^{-10}$	$5.5.10^{-10}$	$3.3.10^{-10}$	$2.6.10^{-10}$
germanium									
Ge-66		1.0	$8.3.10^{-10}$	1.0	$5.3.10^{-10}$	$2.9.10^{-10}$	$1.9.10^{-10}$	$1.3.10^{-10}$	$1.0.10^{-10}$
Ge-67		1.0	$7.7.10^{-10}$	1.0	$4.2.10^{-10}$	$2.1.10^{-10}$	$1.2.10^{-10}$	$8.2.10^{-11}$	$6.5.10^{-11}$
Ge-68		1.0	$1.2.10^{-8}$	1.0	$8.0.10^{-9}$	$4.2.10^{-9}$	$2.6.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
Ge-69		1.0	$2.0.10^{-9}$	1.0	$1.3.10^{-9}$	$7.1.10^{-10}$	$4.6.10^{-10}$	$3.0.10^{-10}$	$2.4.10^{-10}$
Ge-71		1.0	$1.2.10^{-10}$	1.0	$7.8.10^{-11}$	$4.0.10^{-11}$	$2.4.10^{-11}$	$1.5.10^{-11}$	$1.2.10^{-11}$
Ge-75		1.0	$5.5.10^{-10}$	1.0	$3.1.10^{-10}$	$1.5.10^{-10}$	$8.7.10^{-11}$	$5.9.10^{-11}$	$4.6.10^{-11}$
Ge-77		1.0	$3.0.10^{-9}$	1.0	$1.8.10^{-9}$	$9.9.10^{-10}$	$6.2.10^{-10}$	$4.1.10^{-10}$	$3.3.10^{-10}$
Ge-78		1.0	$1.2.10^{-9}$	1.0	$7.0.10^{-10}$	$3.6.10^{-10}$	$2.2.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
arsenic									
As-69		1.0	$6.6.10^{-10}$	0.5	$3.7.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$7.2.10^{-11}$	$5.7.10^{-11}$
As-70		1.0	$1.2.10^{-9}$	0.5	$7.8.10^{-10}$	$4.1.10^{-10}$	$2.5.10^{-10}$	$1.7.10^{-10}$	$1.3.10^{-10}$
As-71		1.0	$2.8.10^{-9}$	0.5	$2.8.10^{-9}$	$1.5.10^{-9}$	$9.3.10^{-10}$	$5.7.10^{-10}$	$4.6.10^{-10}$
As-72		1.0	$1.1.10^{-8}$	0.5	$1.2.10^{-8}$	$6.3.10^{-9}$	$3.8.10^{-9}$	$2.3.10^{-9}$	$1.8.10^{-9}$
As-73		1.0	$2.6.10^{-9}$	0.5	$1.9.10^{-9}$	$9.3.10^{-10}$	$5.6.10^{-10}$	$3.2.10^{-10}$	$2.6.10^{-10}$
As-74		1.0	$1.0.10^{-8}$	0.5	$8.2.10^{-9}$	$4.3.10^{-9}$	$2.6.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
As-76		1.0	$1.0.10^{-8}$	0.5	$1.1.10^{-8}$	$5.8.10^{-9}$	$3.4.10^{-9}$	$2.0.10^{-9}$	$1.6.10^{-9}$
As-77		1.0	$2.7.10^{-9}$	0.5	$2.9.10^{-9}$	$1.5.10^{-9}$	$8.7.10^{-10}$	$5.0.10^{-10}$	$4.0.10^{-10}$
As-78		1.0	$2.0.10^{-9}$	0.5	$1.4.10^{-9}$	$7.0.10^{-10}$	$4.1.10^{-10}$	$2.7.10^{-10}$	$2.1.10^{-10}$
selenium									
Se-70		1.0	$1.0.10^{-9}$	0.8	$7.1.10^{-10}$	$3.6.10^{-10}$	$2.2.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
Se-73		1.0	$1.6.10^{-9}$	0.8	$1.4.10^{-9}$	$7.4.10^{-10}$	$4.8.10^{-10}$	$2.5.10^{-10}$	$2.1.10^{-10}$
Se-73m		1.0	$2.6.10^{-10}$	0.8	$1.8.10^{-10}$	$9.5.10^{-11}$	$5.9.10^{-11}$	$3.5.10^{-11}$	$2.8.10^{-11}$
Se-75		1.0	$2.0.10^{-8}$	0.8	$1.3.10^{-8}$	$8.3.10^{-9}$	$6.0.10^{-9}$	$3.1.10^{-9}$	$2.6.10^{-9}$
Se-79		1.0	$4.1.10^{-8}$	0.8	$2.8.10^{-8}$	$1.9.10^{-8}$	$1.4.10^{-8}$	$4.1.10^{-9}$	$2.9.10^{-9}$
Se-81		1.0	$3.4.10^{-10}$	0.8	$1.9.10^{-10}$	$9.0.10^{-11}$	$5.1.10^{-11}$	$3.4.10^{-11}$	$2.7.10^{-11}$
Se-81m		1.0	$6.0.10^{-10}$	0.8	$3.7.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$6.7.10^{-11}$	$5.3.10^{-11}$
Se-83		1.0	$4.6.10^{-10}$	0.8	$2.9.10^{-10}$	$1.5.10^{-10}$	$8.7.10^{-11}$	$5.9.10^{-11}$	$4.7.10^{-11}$

Element		f_1	h_{ing}[Sv/Bq]	f_1	h_{ing} [Sv/Bq]				
Nuclide		age < 1 year		≥ 1 year	1 year	5 years	10 years	15 years	adult
bromine									
Br-74		1.0	$9.0.10^{-10}$	1.0	$5.2.10^{-10}$	$2.6.10^{-10}$	$1.5.10^{-10}$	$1.1.10^{-10}$	$8.4.10^{-11}$
Br-74m		1.0	$1.5.10^{-9}$	1.0	$8.5.10^{-10}$	$4.3.10^{-10}$	$2.5.10^{-10}$	$1.7.10^{-10}$	$1.4.10^{-10}$
Br-75		1.0	$8.5.10^{-10}$	1.0	$4.9.10^{-10}$	$2.5.10^{-10}$	$1.5.10^{-10}$	$9.9.10^{-11}$	$7.9.10^{-11}$
Br-76		1.0	$4.2.10^{-9}$	1.0	$2.7.10^{-9}$	$1.4.10^{-9}$	$8.7.10^{-10}$	$5.6.10^{-10}$	$4.6.10^{-10}$
Br-77		1.0	$6.3.10^{-10}$	1.0	$4.4.10^{-10}$	$2.5.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$9.6.10^{-11}$
Br-80		1.0	$3.9.10^{-10}$	1.0	$2.1.10^{-10}$	$1.0.10^{-10}$	$5.8.10^{-11}$	$3.9.10^{-11}$	$3.1.10^{-11}$
Br-80m		1.0	$1.4.10^{-9}$	1.0	$8.0.10^{-10}$	$3.9.10^{-10}$	$2.3.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
Br-82		1.0	$3.7.10^{-9}$	1.0	$2.6.10^{-9}$	$1.5.10^{-9}$	$9.5.10^{-10}$	$6.4.10^{-10}$	$5.4.10^{-10}$
Br-83		1.0	$5.3.10^{-10}$	1.0	$3.0.10^{-10}$	$1.4.10^{-10}$	$8.3.10^{-11}$	$5.5.10^{-11}$	$4.3.10^{-11}$
Br-84		1.0	$1.0.10^{-9}$	1.0	$5.8.10^{-10}$	$2.8.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$8.8.10^{-11}$
rubidium									
Rb-79		1.0	$5.7.10^{-10}$	1.0	$3.2.10^{-10}$	$1.6.10^{-10}$	$9.2.10^{-11}$	$6.3.10^{-11}$	$5.0.10^{-11}$
Rb-81		1.0	$5.4.10^{-10}$	1.0	$3.2.10^{-10}$	$1.6.10^{-10}$	$1.0.10^{-10}$	$6.7.10^{-11}$	$5.4.10^{-11}$
Rb-81m		1.0	$1.1.10^{-10}$	1.0	$6.2.10^{-11}$	$3.1.10^{-11}$	$1.8.10^{-11}$	$1.2.10^{-11}$	$9.7.10^{-12}$
Rb-82m		1.0	$8.7.10^{-10}$	1.0	$5.9.10^{-10}$	$3.4.10^{-10}$	$2.2.10^{-10}$	$1.5.10^{-10}$	$1.3.10^{-10}$
Rb-83		1.0	$1.1.10^{-8}$	1.0	$8.4.10^{-9}$	$4.9.10^{-9}$	$3.2.10^{-9}$	$2.2.10^{-9}$	$1.9.10^{-9}$
Rb-84		1.0	$2.0.10^{-8}$	1.0	$1.4.10^{-8}$	$7.9.10^{-9}$	$5.0.10^{-9}$	$3.3.10^{-9}$	$2.8.10^{-9}$
Rb-86		1.0	$3.1.10^{-8}$	1.0	$2.0.10^{-8}$	$9.9.10^{-9}$	$5.9.10^{-9}$	$3.5.10^{-9}$	$2.8.10^{-9}$
Rb-87		1.0	$1.5.10^{-8}$	1.0	$1.0.10^{-8}$	$5.2.10^{-9}$	$3.1.10^{-9}$	$1.8.10^{-9}$	$1.5.10^{-9}$
Rb-88		1.0	$1.1.10^{-9}$	1.0	$6.2.10^{-10}$	$3.0.10^{-10}$	$1.7.10^{-10}$	$1.2.10^{-10}$	$9.0.10^{-11}$
Rb-89		1.0	$5.4.10^{-10}$	1.0	$3.0.10^{-10}$	$1.5.10^{-10}$	$8.6.10^{-11}$	$5.9.10^{-11}$	$4.7.10^{-11}$
strontium									
Sr-80		0.6	$3.7.10^{-9}$	0.4^X	$2.3.10^{-9}$	$1.1.10^{-9}$	$6.5.10^{-10}$	$4.2.10^{-10}$	$3.4.10^{-10}$
Sr-81		0.6	$8.4.10^{-10}$	0.4^X	$4.9.10^{-10}$	$2.4.10^{-10}$	$1.4.10^{-10}$	$9.6.10^{-11}$	$7.7.10^{-11}$
Sr-82		0.6	$7.2.10^{-8}$	0.4^X	$4.1.10^{-8}$	$2.1.10^{-8}$	$1.3.10^{-8}$	$8.7.10^{-9}$	$6.1.10^{-9}$
Sr-83		0.6	$3.4.10^{-9}$	0.4^X	$2.7.10^{-9}$	$1.4.10^{-9}$	$9.1.10^{-10}$	$5.7.10^{-10}$	$4.9.10^{-10}$
Sr-85		0.6	$7.7.10^{-9}$	0.4^X	$3.1.10^{-9}$	$1.7.10^{-9}$	$1.5.10^{-9}$	$1.3.10^{-9}$	$5.6.10^{-10}$
Sr-85m		0.6	$4.5.10^{-11}$	0.4^X	$3.0.10^{-11}$	$1.7.10^{-11}$	$1.1.10^{-11}$	$7.8.10^{-12}$	$6.1.10^{-12}$
Sr-87m		0.6	$2.4.10^{-10}$	0.4^X	$1.7.10^{-10}$	$9.0.10^{-11}$	$5.6.10^{-11}$	$3.6.10^{-11}$	$3.0.10^{-11}$
Sr-89		0.6	$3.6.10^{-8}$	0.4^X	$1.8.10^{-8}$	$8.9.10^{-9}$	$5.8.10^{-9}$	$4.0.10^{-9}$	$2.6.10^{-9}$
Sr-90		0.6	$2.3.10^{-7}$	0.4^X	$7.3.10^{-8}$	$4.7.10^{-8}$	$6.0.10^{-8}$	$8.0.10^{-8}$	$2.8.10^{-8}$
Sr-91		0.6	$5.2.10^{-9}$	0.4^X	$4.0.10^{-9}$	$2.1.10^{-9}$	$1.2.10^{-9}$	$7.4.10^{-10}$	$6.5.10^{-10}$
Sr-92		0.6	$3.4.10^{-9}$	0.4^X	$2.7.10^{-9}$	$1.4.10^{-9}$	$8.2.10^{-10}$	$4.8.10^{-10}$	$4.3.10^{-10}$
yttrium									
Y-86		0.001	$7.6.10^{-9}$	$1.0.10^{-4}$	$5.2.10^{-9}$	$2.9.10^{-9}$	$1.9.10^{-9}$	$1.2.10^{-9}$	$9.6.10^{-10}$

Element		f_1	h_{ing}[Sv/Bq]	f_1	h_{ing} [Sv/Bq]				
Nuclide		age < 1 year		≥ 1 year	1 year	5 years	10 years	15 years	adult
Y-86m		0.001	$4.5.10^{-10}$	$1.0.10^{-4}$	$3.1.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$7.1.10^{-11}$	$5.6.10^{-11}$
Y-87		0.001	$4.6.10^{-9}$	$1.0.10^{-4}$	$3.2.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$7.0.10^{-10}$	$5.5.10^{-10}$
Y-88		0.001	$8.1.10^{-9}$	$1.0.10^{-4}$	$6.0.10^{-9}$	$3.5.10^{-9}$	$2.4.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
Y-90		0.001	$3.1.10^{-8}$	$1.0.10^{-4}$	$2.0.10^{-8}$	$1.0.10^{-8}$	$5.9.10^{-9}$	$3.3.10^{-9}$	$2.7.10^{-9}$
Y-90m		0.001	$1.8.10^{-9}$	$1.0.10^{-4}$	$1.2.10^{-9}$	$6.1.10^{-10}$	$3.7.10^{-10}$	$2.2.10^{-10}$	$1.7.10^{-10}$
Y-91		0.001	$2.8.10^{-8}$	$1.0.10^{-4}$	$1.8.10^{-8}$	$8.8.10^{-9}$	$5.2.10^{-9}$	$2.9.10^{-9}$	$2.4.10^{-9}$
Y-91m		0.001	$9.2.10^{-11}$	$1.0.10^{-4}$	$6.0.10^{-11}$	$3.3.10^{-11}$	$2.1.10^{-11}$	$1.4.10^{-11}$	$1.1.10^{-11}$
Y-92		0.001	$5.9.10^{-9}$	$1.0.10^{-4}$	$3.6.10^{-9}$	$1.8.10^{-9}$	$1.0.10^{-9}$	$6.2.10^{-10}$	$4.9.10^{-10}$
Y-93		0.001	$1.4.10^{-8}$	$1.0.10^{-4}$	$8.5.10^{-9}$	$4.3.10^{-9}$	$2.5.10^{-9}$	$1.4.10^{-9}$	$1.2.10^{-9}$
Y-94		0.001	$9.9.10^{-10}$	$1.0.10^{-4}$	$5.5.10^{-10}$	$2.7.10^{-10}$	$1.5.10^{-10}$	$1.0.10^{-10}$	$8.1.10^{-11}$
Y-95		0.001	$5.7.10^{-10}$	$1.0.10^{-4}$	$3.1.10^{-10}$	$1.5.10^{-10}$	$8.7.10^{-11}$	$5.9.10^{-11}$	$4.6.10^{-11}$
zirconium									
Zr-86		0.02	$6.9.10^{-9}$	0.01	$4.8.10^{-9}$	$2.7.10^{-9}$	$1.7.10^{-9}$	$1.1.10^{-9}$	$8.6.10^{-10}$
Zr-88		0.02	$2.8.10^{-9}$	0.01	$2.0.10^{-9}$	$1.2.10^{-9}$	$8.0.10^{-10}$	$5.4.10^{-10}$	$4.5.10^{-10}$
Zr-89		0.02	$6.5.10^{-9}$	0.01	$4.5.10^{-9}$	$2.5.10^{-9}$	$1.6.10^{-9}$	$9.9.10^{-10}$	$7.9.10^{-10}$
Zr-93		0.02	$1.2.10^{-9}$	0.01	$7.6.10^{-10}$	$5.1.10^{-10}$	$5.8.10^{-10}$	$8.6.10^{-10}$	$1.1.10^{-9}$
Zr-95		0.02	$8.5.10^{-9}$	0.01	$5.6.10^{-9}$	$3.0.10^{-9}$	$1.9.10^{-9}$	$1.2.10^{-9}$	$9.5.10^{-10}$
Zr-97		0.02	$2.2.10^{-8}$	0.01	$1.4.10^{-8}$	$7.3.10^{-9}$	$4.4.10^{-9}$	$2.6.10^{-9}$	$2.1.10^{-9}$
niobium									
Nb-88		0.02	$6.7.10^{-10}$	0.01	$3.8.10^{-10}$	$1.9.10^{-10}$	$1.1.10^{-10}$	$7.9.10^{-11}$	$6.3.10^{-11}$
Nb-89		0.02	$3.0.10^{-9}$	0.01	$2.0.10^{-9}$	$1.0.10^{-9}$	$6.0.10^{-10}$	$3.4.10^{-10}$	$2.7.10^{-10}$
Nb-89m		0.02	$1.5.10^{-9}$	0.01	$8.7.10^{-10}$	$4.4.10^{-10}$	$2.7.10^{-10}$	$1.8.10^{-10}$	$1.4.10^{-10}$
Nb-90		0.02	$1.1.10^{-8}$	0.01	$7.2.10^{-9}$	$3.9.10^{-9}$	$2.5.10^{-9}$	$1.6.10^{-9}$	$1.2.10^{-9}$
Nb-93m		0.02	$1.5.10^{-9}$	0.01	$9.1.10^{-10}$	$4.6.10^{-10}$	$2.7.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
Nb-94		0.02	$1.5.10^{-8}$	0.01	$9.7.10^{-9}$	$5.3.10^{-9}$	$3.4.10^{-9}$	$2.1.10^{-9}$	$1.7.10^{-9}$
Nb-95		0.02	$4.6.10^{-9}$	0.01	$3.2.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$7.4.10^{-10}$	$5.8.10^{-10}$
Nb-95m		0.02	$6.4.10^{-9}$	0.01	$4.1.10^{-9}$	$2.1.10^{-9}$	$1.2.10^{-9}$	$7.1.10^{-10}$	$5.6.10^{-10}$
Nb-96		0.02	$9.2.10^{-9}$	0.01	$6.3.10^{-9}$	$3.4.10^{-9}$	$2.2.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
Nb-97		0.02	$7.7.10^{-10}$	0.01	$4.5.10^{-10}$	$2.3.10^{-10}$	$1.3.10^{-10}$	$8.7.10^{-11}$	$6.8.10^{-11}$
Nb-98m		0.02	$1.2.10^{-9}$	0.01	$7.1.10^{-10}$	$3.6.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
molybdenum									
Mo-90		1.0	$1.7.10^{-9}$	1.0	$1.2.10^{-9}$	$6.3.10^{-10}$	$4.0.10^{-10}$	$2.7.10^{-10}$	$2.2.10^{-10}$
Mo-93		1.0	$7.9.10^{-9}$	1.0	$6.9.10^{-9}$	$5.0.10^{-9}$	$4.0.10^{-9}$	$3.4.10^{-9}$	$3.1.10^{-9}$
Mo-93m		1.0	$8.0.10^{-10}$	1.0	$5.4.10^{-10}$	$3.1.10^{-10}$	$2.0.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
Mo-99		1.0	$5.5.10^{-9}$	1.0	$3.5.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$7.6.10^{-10}$	$6.0.10^{-10}$
Mo-101		1.0	$4.8.10^{-10}$	1.0	$2.7.10^{-10}$	$1.3.10^{-10}$	$7.6.10^{-11}$	$5.2.10^{-11}$	$4.1.10^{-11}$

Element		f_1	h_{ing}[Sv/Bq]	f_1	h_{ing} [Sv/Bq]				
Nuclide		age < 1 year		≥ 1 year	1 year	5 years	10 years	15 years	adult
technetium									
Tc-93		1.0	$2.7.10^{-10}$	0.5	$2.5.10^{-10}$	$1.5.10^{-10}$	$9.8.10^{-11}$	$6.8.10^{-11}$	$5.5.10^{-11}$
Tc-93m		1.0	$2.0.10^{-10}$	0.5	$1.3.10^{-10}$	$7.3.10^{-11}$	$4.6.10^{-11}$	$3.2.10^{-11}$	$2.5.10^{-11}$
Tc-94		1.0	$1.2.10^{-9}$	0.5	$1.0.10^{-9}$	$5.8.10^{-10}$	$3.7.10^{-10}$	$2.5.10^{-10}$	$2.0.10^{-10}$
Tc-94m		1.0	$1.3.10^{-9}$	0.5	$6.5.10^{-10}$	$3.3.10^{-10}$	$1.9.10^{-10}$	$1.3.10^{-10}$	$1.0.10^{-10}$
Tc-95		1.0	$9.9.10^{-10}$	0.5	$8.7.10^{-10}$	$5.0.10^{-10}$	$3.3.10^{-10}$	$2.3.10^{-10}$	$1.8.10^{-10}$
Tc-95m		1.0	$4.7.10^{-9}$	0.5	$2.8.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$7.0.10^{-10}$	$5.6.10^{-10}$
Tc-96		1.0	$6.7.10^{-9}$	0.5	$5.1.10^{-9}$	$3.0.10^{-9}$	$2.0.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
Tc-96m		1.0	$1.0.10^{-10}$	0.5	$6.5.10^{-11}$	$3.6.10^{-11}$	$2.3.10^{-11}$	$1.6.10^{-11}$	$1.2.10^{-11}$
Tc-97		1.0	$9.9.10^{-10}$	0.5	$4.9.10^{-10}$	$2.4.10^{-10}$	$1.4.10^{-10}$	$8.8.10^{-11}$	$6.8.10^{-11}$
Tc-97m		1.0	$8.7.10^{-9}$	0.5	$4.1.10^{-9}$	$2.0.10^{-9}$	$1.1.10^{-9}$	$7.0.10^{-10}$	$5.5.10^{-10}$
Tc-98		1.0	$2.3.10^{-8}$	0.5	$1.2.10^{-8}$	$6.1.10^{-9}$	$3.7.10^{-9}$	$2.5.10^{-9}$	$2.0.10^{-9}$
Tc-99		1.0	$1.0.10^{-8}$	0.5	$4.8.10^{-9}$	$2.3.10^{-9}$	$1.3.10^{-9}$	$8.2.10^{-10}$	$6.4.10^{-10}$
Tc-99m		1.0	$2.0.10^{-10}$	0.5	$1.3.10^{-10}$	$7.2.10^{-11}$	$4.3.10^{-11}$	$2.8.10^{-11}$	$2.2.10^{-11}$
Tc-101		1.0	$2.4.10^{-10}$	0.5	$1.3.10^{-10}$	$6.1.10^{-11}$	$3.5.10^{-11}$	$2.4.10^{-11}$	$1.9.10^{-11}$
Tc-104		1.0	$1.0.10^{-9}$	0.5	$5.3.10^{-10}$	$2.6.10^{-10}$	$1.5.10^{-10}$	$1.0.10^{-10}$	$8.0.10^{-11}$
ruthenium									
Ru-94		0.1	$9.3.10^{-10}$	0.05	$5.9.10^{-10}$	$3.1.10^{-10}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$9.4.10^{-11}$
Ru-97		0.1	$1.2.10^{-9}$	0.05	$8.5.10^{-10}$	$4.7.10^{-10}$	$3.0.10^{-10}$	$1.9.10^{-10}$	$1.5.10^{-10}$
Ru-103		0.1	$7.1.10^{-9}$	0.05	$4.6.10^{-9}$	$2.4.10^{-9}$	$1.5.10^{-9}$	$9.2.10^{-10}$	$7.3.10^{-10}$
Ru-105		0.1	$2.7.10^{-9}$	0.05	$1.8.10^{-9}$	$9.1.10^{-10}$	$5.5.10^{-10}$	$3.3.10^{-10}$	$2.6.10^{-10}$
Ru-106		0.1	$8.4.10^{-8}$	0.05	$4.9.10^{-8}$	$2.5.10^{-8}$	$1.5.10^{-8}$	$8.6.10^{-9}$	$7.0.10^{-9}$
rhodium									
Rh-99		0.1	$4.2.10^{-9}$	0.05	$2.9.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$6.5.10^{-10}$	$5.1.10^{-10}$
Rh-99m		0.1	$4.9.10^{-10}$	0.05	$3.5.10^{-10}$	$2.0.10^{-10}$	$1.3.10^{-10}$	$8.3.10^{-11}$	$6.6.10^{-11}$
Rh-100		0.1	$4.9.10^{-9}$	0.05	$3.6.10^{-9}$	$2.0.10^{-9}$	$1.4.10^{-9}$	$8.8.10^{-10}$	$7.1.10^{-10}$
Rh-101		0.1	$4.9.10^{-9}$	0.05	$2.8.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$6.7.10^{-10}$	$5.5.10^{-10}$
Rh-101m		0.1	$1.7.10^{-9}$	0.05	$1.2.10^{-9}$	$6.8.10^{-10}$	$4.4.10^{-10}$	$2.8.10^{-10}$	$2.2.10^{-10}$
Rh-102m		0.1	$1.9.10^{-8}$	0.05	$1.0.10^{-8}$	$6.4.10^{-9}$	$4.3.10^{-9}$	$3.0.10^{-9}$	$2.6.10^{-9}$
Rh-102		0.1	$1.2.10^{-8}$	0.05	$7.4.10^{-9}$	$3.9.10^{-9}$	$2.4.10^{-9}$	$1.4.10^{-9}$	$1.2.10^{-9}$
Rh-103m		0.1	$4.7.10^{-11}$	0.05	$2.7.10^{-11}$	$1.3.10^{-11}$	$7.4.10^{-12}$	$4.8.10^{-12}$	$3.8.10^{-12}$
Rh-105		0.1	$4.0.10^{-9}$	0.05	$2.7.10^{-9}$	$1.3.10^{-9}$	$8.0.10^{-10}$	$4.6.10^{-10}$	$3.7.10^{-10}$
Rh-106m		0.1	$1.4.10^{-9}$	0.05	$9.7.10^{-10}$	$5.3.10^{-10}$	$3.3.10^{-10}$	$2.0.10^{-10}$	$1.6.10^{-10}$
Rh-107		0.1	$2.9.10^{-10}$	0.05	$1.6.10^{-10}$	$7.9.10^{-11}$	$4.5.10^{-11}$	$3.1.10^{-11}$	$2.4.10^{-11}$
palladium									
Pd-100		0.05	$7.4.10^{-9}$	0.005	$5.2.10^{-9}$	$2.9.10^{-9}$	$1.9.10^{-9}$	$1.2.10^{-9}$	$9.4.10^{-10}$

Element		**f_1**	**h_{ing}[Sv/Bq]**	**f_1**	**h_{ing} [Sv/Bq]**				
Nuclide		**age < 1 year**		**≥ 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Pd-101		0.05	$8.2.10^{-10}$	0.005	$5.7.10^{-10}$	$3.1.10^{-10}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$9.4.10^{-11}$
Pd-103		0.05	$2.2.10^{-9}$	0.005	$1.4.10^{-9}$	$7.2.10^{-10}$	$4.3.10^{-10}$	$2.4.10^{-10}$	$1.9.10^{-10}$
Pd-107		0.05	$4.4.10^{-10}$	0.005	$2.8.10^{-10}$	$1.4.10^{-10}$	$8.1.10^{-11}$	$4.6.10^{-11}$	$3.7.10^{-11}$
Pd-109		0.05	$6.3.10^{-9}$	0.005	$4.1.10^{-9}$	$2.0.10^{-9}$	$1.2.10^{-9}$	$6.8.10^{-10}$	$5.5.10^{-10}$
silver									
Ag-102		0.1	$4.2.10^{-10}$	0.05	$2.4.10^{-10}$	$1.2.10^{-10}$	$7.3.10^{-11}$	$5.0.10^{-11}$	$4.0.10^{-11}$
Ag-103		0.1	$4.5.10^{-10}$	0.05	$2.7.10^{-10}$	$1.4.10^{-10}$	$8.3.10^{-11}$	$5.5.10^{-11}$	$4.3.10^{-11}$
Ag-104		0.1	$4.3.10^{-10}$	0.05	$2.9.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$7.5.10^{-11}$	$6.0.10^{-11}$
Ag-104m		0.1	$5.6.10^{-10}$	0.05	$3.3.10^{-10}$	$1.7.10^{-10}$	$1.0.10^{-10}$	$6.8.10^{-11}$	$5.4.10^{-11}$
Ag-105		0.1	$3.9.10^{-9}$	0.05	$2.5.10^{-9}$	$1.4.10^{-9}$	$9.1.10^{-10}$	$5.9.10^{-10}$	$4.7.10^{-10}$
Ag-106		0.1	$3.7.10^{-10}$	0.05	$2.1.10^{-10}$	$1.0.10^{-10}$	$6.0.10^{-11}$	$4.1.10^{-11}$	$3.2.10^{-11}$
Ag-106m		0.1	$9.7.10^{-9}$	0.05	$6.9.10^{-9}$	$4.1.10^{-9}$	$2.8.10^{-9}$	$1.8.10^{-9}$	$1.5.10^{-9}$
Ag-108m		0.1	$2.1.10^{-8}$	0.05	$1.1.10^{-8}$	$6.5.10^{-9}$	$4.3.10^{-9}$	$2.8.10^{-9}$	$2.3.10^{-9}$
Ag-110m		0.1	$2.4.10^{-8}$	0.05	$1.4.10^{-8}$	$7.8.10^{-9}$	$5.2.10^{-9}$	$3.4.10^{-9}$	$2.8.10^{-9}$
Ag-111		0.1	$1.4.10^{-8}$	0.05	$9.3.10^{-9}$	$4.6.10^{-9}$	$2.7.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
Ag-112		0.1	$4.9.10^{-9}$	0.05	$3.0.10^{-9}$	$1.5.10^{-9}$	$8.9.10^{-10}$	$5.4.10^{-10}$	$4.3.10^{-10}$
Ag-115		0.1	$7.2.10^{-10}$	0.05	$4.1.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$7.7.10^{-11}$	$6.0.10^{-11}$
cadmium									
Cd-104		0.1	$4.2.10^{-10}$	0.05	$2.9.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$7.2.10^{-11}$	$5.4.10^{-11}$
Cd-107		0.1	$7.1.10^{-10}$	0.05	$4.6.10^{-10}$	$2.3.10^{-10}$	$1.3.10^{-10}$	$7.8.10^{-11}$	$6.2.10^{-11}$
Cd-109		0.1	$2.1.10^{-8}$	0.05	$9.5.10^{-9}$	$5.5.10^{-9}$	$3.5.10^{-9}$	$2.4.10^{-9}$	$2.0.10^{-9}$
Cd-113		0.1	$1.0.10^{-7}$	0.05	$4.8.10^{-8}$	$3.7.10^{-8}$	$3.0.10^{-8}$	$2.6.10^{-8}$	$2.5.10^{-8}$
Cd-113m		0.1	$1.2.10^{-7}$	0.05	$5.6.10^{-8}$	$3.9.10^{-8}$	$2.9.10^{-8}$	$2.4.10^{-8}$	$2.3.10^{-8}$
Cd-115		0.1	$1.4.10^{-8}$	0.05	$9.7.10^{-9}$	$4.9.10^{-9}$	$2.9.10^{-9}$	$1.7.10^{-9}$	$1.4.10^{-9}$
Cd-115m		0.1	$4.1.10^{-8}$	0.05	$1.9.10^{-8}$	$9.7.10^{-9}$	$6.9.10^{-9}$	$4.1.10^{-9}$	$3.3.10^{-9}$
Cd-117		0.1	$2.9.10^{-9}$	0.05	$1.9.10^{-9}$	$9.5.10^{-10}$	$5.7.10^{-10}$	$3.5.10^{-10}$	$2.8.10^{-10}$
Cd-117m		0.1	$2.6.10^{-9}$	0.05	$1.7.10^{-9}$	$9.0.10^{-10}$	$5.6.10^{-10}$	$3.5.10^{-10}$	$2.8.10^{-10}$
indium									
In-109		0.04	$5.2.10^{-10}$	0.02	$3.6.10^{-10}$	$2.0.10^{-10}$	$1.3.10^{-10}$	$8.2.10^{-11}$	$6.6.10^{-11}$
In-110		0.04	$1.5.10^{-9}$	0.02	$1.1.10^{-9}$	$6.5.10^{-10}$	$4.4.10^{-10}$	$3.0.10^{-10}$	$2.4.10^{-10}$
In-110m		0.04	$1.1.10^{-9}$	0.02	$6.4.10^{-10}$	$3.2.10^{-10}$	$1.9.10^{-10}$	$1.3.10^{-10}$	$1.0.10^{-10}$
In-111		0.04	$2.4.10^{-9}$	0.02	$1.7.10^{-9}$	$9.1.10^{-10}$	$5.9.10^{-10}$	$3.7.10^{-10}$	$2.9.10^{-10}$
In-112		0.04	$1.2.10^{-10}$	0.02	$6.7.10^{-11}$	$3.3.10^{-11}$	$1.9.10^{-11}$	$1.3.10^{-11}$	$1.0.10^{-11}$
In-113m		0.04	$3.0.10^{-10}$	0.02	$1.8.10^{-10}$	$9.3.10^{-11}$	$6.2.10^{-11}$	$3.6.10^{-11}$	$2.8.10^{-11}$
In-114m		0.04	$5.6.10^{-8}$	0.02	$3.1.10^{-8}$	$1.5.10^{-8}$	$9.0.10^{-9}$	$5.2.10^{-9}$	$4.1.10^{-9}$
In-115		0.04	$1.3.10^{-7}$	0.02	$6.4.10^{-8}$	$4.8.10^{-8}$	$4.3.10^{-8}$	$3.6.10^{-8}$	$3.2.10^{-8}$

Element		f_1	h_{ing}[Sv/Bq]	f_1	h_{ing} [Sv/Bq]				
Nuclide		**age < 1 year**		**≥ 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
In-115m		0.04	$9.6.10^{-10}$	0.02	$6.0.10^{-10}$	$3.0.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$8.6.10^{-11}$
In-116m		0.04	$5.8.10^{-10}$	0.02	$3.6.10^{-10}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$8.0.10^{-11}$	$6.4.10^{-11}$
In-117		0.04	$3.3.10^{-10}$	0.02	$1.9.10^{-10}$	$9.7.10^{-11}$	$5.8.10^{-11}$	$3.9.10^{-11}$	$3.1.10^{-11}$
In-117m		0.04	$1.4.10^{-9}$	0.02	$8.6.10^{-10}$	$4.3.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$	$1.2.10^{-10}$
In-119m		0.04	$5.9.10^{-10}$	0.02	$3.2.10^{-10}$	$1.6.10^{-10}$	$8.8.10^{-11}$	$6.0.10^{-11}$	$4.7.10^{-11}$
tin									
Sn-110		0.04	$3.5.10^{-9}$	0.02	$2.3.10^{-9}$	$1.2.10^{-9}$	$7.4.10^{-10}$	$4.4.10^{-10}$	$3.5.10^{-10}$
Sn-111		0.04	$2.5.10^{-10}$	0.02	$1.5.10^{-10}$	$7.4.10^{-11}$	$4.4.10^{-11}$	$3.0.10^{-11}$	$2.3.10^{-11}$
Sn-113		0.04	$7.8.10^{-9}$	0.02	$5.0.10^{-9}$	$2.6.10^{-9}$	$1.6.10^{-9}$	$9.2.10^{-10}$	$7.3.10^{-10}$
Sn-117m		0.04	$7.7.10^{-9}$	0.02	$5.0.10^{-9}$	$2.5.10^{-9}$	$1.5.10^{-9}$	$8.8.10^{-10}$	$7.1.10^{-10}$
Sn-119m		0.04	$4.1.10^{-9}$	0.02	$2.5.10^{-9}$	$1.3.10^{-9}$	$7.5.10^{-10}$	$4.3.10^{-10}$	$3.4.10^{-10}$
Sn-121		0.04	$2.6.10^{-9}$	0.02	$1.7.10^{-9}$	$8.4.10^{-10}$	$5.0.10^{-10}$	$2.8.10^{-10}$	$2.3.10^{-10}$
Sn-121m		0.04	$4.6.10^{-9}$	0.02	$2.7.10^{-9}$	$1.4.10^{-9}$	$8.2.10^{-10}$	$4.7.10^{-10}$	$3.8.10^{-10}$
Sn-123		0.04	$2.5.10^{-8}$	0.02	$1.6.10^{-8}$	$7.8.10^{-9}$	$4.6.10^{-9}$	$2.6.10^{-9}$	$2.1.10^{-9}$
Sn-123m		0.04	$4.7.10^{-10}$	0.02	$2.6.10^{-10}$	$1.3.10^{-10}$	$7.3.10^{-11}$	$4.9.10^{-11}$	$3.8.10^{-11}$
Sn-125		0.04	$3.5.10^{-8}$	0.02	$2.2.10^{-8}$	$1.1.10^{-8}$	$6.7.10^{-9}$	$3.8.10^{-9}$	$3.1.10^{-9}$
Sn-126		0.04	$5.0.10^{-8}$	0.02	$3.0.10^{-8}$	$1.6.10^{-8}$	$9.8.10^{-9}$	$5.9.10^{-9}$	$4.7.10^{-9}$
Sn-127		0.04	$2.0.10^{-9}$	0.02	$1.3.10^{-9}$	$6.6.10^{-10}$	$4.0.10^{-10}$	$2.5.10^{-10}$	$2.0.10^{-10}$
Sn-128		0.04	$1.6.10^{-9}$	0.02	$9.7.10^{-10}$	$4.9.10^{-10}$	$3.0.10^{-10}$	$1.9.10^{-10}$	$1.5.10^{-10}$
antimony									
Sb-115		0.2	$2.5.10^{-10}$	0.1	$1.5.10^{-10}$	$7.5.10^{-11}$	$4.5.10^{-11}$	$3.1.10^{-11}$	$2.4.10^{-11}$
Sb-116		0.2	$2.7.10^{-10}$	0.1	$1.6.10^{-10}$	$8.0.10^{-11}$	$4.8.10^{-11}$	$3.3.10^{-11}$	$2.6.10^{-11}$
Sb-116m		0.2	$5.0.10^{-10}$	0.1	$3.3.10^{-10}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$8.3.10^{-11}$	$6.7.10^{-11}$
Sb-117		0.2	$1.6.10^{-10}$	0.1	$1.0.10^{-10}$	$5.6.10^{-11}$	$3.5.10^{-11}$	$2.2.10^{-11}$	$1.8.10^{-11}$
Sb-118m		0.2	$1.3.10^{-9}$	0.1	$1.0.10^{-9}$	$5.8.10^{-10}$	$3.9.10^{-10}$	$2.6.10^{-10}$	$2.1.10^{-10}$
Sb-119		0.2	$8.4.10^{-10}$	0.1	$5.8.10^{-10}$	$3.0.10^{-10}$	$1.8.10^{-10}$	$1.0.10^{-10}$	$8.0.10^{-11}$
Sb-120m		0.2	$8.1.10^{-9}$	0.1	$6.0.10^{-9}$	$3.5.10^{-9}$	$2.3.10^{-9}$	$1.6.10^{-9}$	$1.2.10^{-9}$
Sb-120		0.2	$1.7.10^{-10}$	0.1	$9.4.10^{-11}$	$4.6.10^{-11}$	$2.7.10^{-11}$	$1.8.10^{-11}$	$1.4.10^{-11}$
Sb-122		0.2	$1.8.10^{-8}$	0.1	$1.2.10^{-8}$	$6.1.10^{-9}$	$3.7.10^{-9}$	$2.1.10^{-9}$	$1.7.10^{-9}$
Sb-124		0.2	$2.5.10^{-8}$	0.1	$1.6.10^{-8}$	$8.4.10^{-9}$	$5.2.10^{-9}$	$3.2.10^{-9}$	$2.5.10^{-9}$
Sb-124m’		0.2	$8.5.10^{-11}$	0.1	$4.9.10^{-11}$	$2.5.10^{-11}$	$1.5.10^{-11}$	$1.0.10^{-11}$	$8.0.10^{-12}$
Sb-125		0.2	$1.1.10^{-8}$	0.1	$6.1.10^{-9}$	$3.4.10^{-9}$	$2.1.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
Sb-126		0.2	$2.0.10^{-8}$	0.1	$1.4.10^{-8}$	$7.6.10^{-9}$	$4.9.10^{-9}$	$3.1.10^{-9}$	$2.4.10^{-9}$
Sb-126m		0.2	$3.9.10^{-10}$	0.1	$2.2.10^{-10}$	$1.1.10^{-10}$	$6.6.10^{-11}$	$4.5.10^{-11}$	$3.6.10^{-11}$
Sb-127		0.2	$1.7.10^{-8}$	0.1	$1.2.10^{-8}$	$5.9.10^{-9}$	$3.6.10^{-9}$	$2.1.10^{-9}$	$1.7.10^{-9}$
Sb-128		0.2	$6.3.10^{-9}$	0.1	$4.5.10^{-9}$	$2.4.10^{-9}$	$1.5.10^{-9}$	$9.5.10^{-10}$	$7.6.10^{-10}$

Element		f_1	h_{ing}[Sv/Bq]	f_1	h_{ing} [Sv/Bq]				
Nuclide		age < 1 year		≥ 1 year	1 year	5 years	10 years	15 years	adult
Sb-128m		0.2	$3.7.10^{-10}$	0.1	$2.1.10^{-10}$	$1.0.10^{-10}$	$6.0.10^{-11}$	$4.1.10^{-11}$	$3.3.10^{-11}$
Sb-129		0.2	$4.3.10^{-9}$	0.1	$2.8.10^{-9}$	$1.5.10^{-9}$	$8.8.10^{-10}$	$5.3.10^{-10}$	$4.2.10^{-10}$
Sb-130		0.2	$9.1.10^{-10}$	0.1	$5.4.10^{-10}$	$2.8.10^{-10}$	$1.7.10^{-10}$	$1.2.10^{-10}$	$9.1.10^{-11}$
Sb-131		0.2	$1.1.10^{-9}$	0.1	$7.3.10^{-10}$	$3.9.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$1.0.10^{-10}$
tellurium									
Te-116		0.6	$1.4.10^{-9}$	0.3	$1.0.10^{-9}$	$5.5.10^{-10}$	$3.4.10^{-10}$	$2.1.10^{-10}$	$1.7.10^{-10}$
Te-121		0.6	$3.1.10^{-9}$	0.3	$2.0.10^{-9}$	$1.2.10^{-9}$	$8.0.10^{-10}$	$5.4.10^{-10}$	$4.3.10^{-10}$
Te-121m		0.6	$2.7.10^{-8}$	0.3	$1.2.10^{-8}$	$6.9.10^{-9}$	$4.2.10^{-9}$	$2.8.10^{-9}$	$2.3.10^{-9}$
Te-123		0.6	$2.0.10^{-8}$	0.3	$9.3.10^{-9}$	$6.9.10^{-9}$	$5.4.10^{-9}$	$4.7.10^{-9}$	$4.4.10^{-9}$
Te-123m		0.6	$1.9.10^{-8}$	0.3	$8.8.10^{-9}$	$4.9.10^{-9}$	$2.8.10^{-9}$	$1.7.10^{-9}$	$1.4.10^{-9}$
Te-125m		0.6	$1.3.10^{-8}$	0.3	$6.3.10^{-9}$	$3.3.10^{-9}$	$1.9.10^{-9}$	$1.1.10^{-9}$	$8.7.10^{-10}$
Te-127		0.6	$1.5.10^{-9}$	0.3	$1.2.10^{-9}$	$6.2.10^{-10}$	$3.6.10^{-10}$	$2.1.10^{-10}$	$1.7.10^{-10}$
Te-127m		0.6	$4.1.10^{-8}$	0.3	$1.8.10^{-8}$	$9.5.10^{-9}$	$5.2.10^{-9}$	$3.0.10^{-9}$	$2.3.10^{-9}$
Te-129		0.6	$7.5.10^{-10}$	0.3	$4.4.10^{-10}$	$2.1.10^{-10}$	$1.2.10^{-10}$	$8.0.10^{-11}$	$6.3.10^{-11}$
Te-129m		0.6	$4.4.10^{-8}$	0.3	$2.4.10^{-8}$	$1.2.10^{-8}$	$6.6.10^{-9}$	$3.9.10^{-9}$	$3.0.10^{-9}$
Te-131		0.6	$9.0.10^{-10}$	0.3	$6.6.10^{-10}$	$3.5.10^{-10}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$8.7.10^{-11}$
Te-131m		0.6	$2.0.10^{-8}$	0.3	$1.4.10^{-8}$	$7.8.10^{-9}$	$4.3.10^{-9}$	$2.7.10^{-9}$	$1.9.10^{-9}$
Te-132		0.6	$4.8.10^{-8}$	0.3	$3.0.10^{-8}$	$1.6.10^{-8}$	$8.3.10^{-9}$	$5.3.10^{-9}$	$3.8.10^{-9}$
Te-133		0.6	$8.4.10^{-10}$	0.3	$6.3.10^{-10}$	$3.3.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$7.2.10^{-11}$
Te-133m		0.6	$3.1.10^{-9}$	0.3	$2.4.10^{-9}$	$1.3.10^{-9}$	$6.3.10^{-10}$	$4.1.10^{-10}$	$2.8.10^{-10}$
Te-134		0.6	$1.1.10^{-9}$	0.3	$7.5.10^{-10}$	$3.9.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
iodine									
I-120		1.0	$3.9.10^{-9}$	1.0	$2.8.10^{-9}$	$1.4.10^{-9}$	$7.2.10^{-10}$	$4.8.10^{-10}$	$3.4.10^{-10}$
I-120m		1.0	$2.3.10^{-9}$	1.0	$1.5.10^{-9}$	$7.8.10^{-10}$	$4.2.10^{-10}$	$2.9.10^{-10}$	$2.1.10^{-10}$
I-121		1.0	$6.2.10^{-10}$	1.0	$5.3.10^{-10}$	$3.1.10^{-10}$	$1.7.10^{-10}$	$1.2.10^{-10}$	$8.2.10^{-11}$
I-123		1.0	$2.2.10^{-9}$	1.0	$1.9.10^{-9}$	$1.1.10^{-9}$	$4.9.10^{-10}$	$3.3.10^{-10}$	$2.1.10^{-10}$
I-124		1.0	$1.2.10^{-7}$	1.0	$1.1.10^{-7}$	$6.3.10^{-8}$	$3.1.10^{-8}$	$2.0.10^{-8}$	$1.3.10^{-8}$
I-125		1.0	$5.2.10^{-8}$	1.0	$5.7.10^{-8}$	$4.1.10^{-8}$	$3.1.10^{-8}$	$2.2.10^{-8}$	$1.5.10^{-8}$
I-126		1.0	$2.1.10^{-7}$	1.0	$2.1.10^{-7}$	$1.3.10^{-7}$	$6.8.10^{-8}$	$4.5.10^{-8}$	$2.9.10^{-8}$
I-128		1.0	$5.7.10^{-10}$	1.0	$3.3.10^{-10}$	$1.6.10^{-10}$	$8.9.10^{-11}$	$6.0.10^{-11}$	$4.6.10^{-11}$
I-129		1.0	$1.8.10^{-7}$	1.0	$2.2.10^{-7}$	$1.7.10^{-7}$	$1.9.10^{-7}$	$1.4.10^{-7}$	$1.1.10^{-7}$
I-130		1.0	$2.1.10^{-8}$	1.0	$1.8.10^{-8}$	$9.8.10^{-9}$	$4.6.10^{-9}$	$3.0.10^{-9}$	$2.0.10^{-9}$
I-131		1.0	$1.8.10^{-7}$	1.0	$1.8.10^{-7}$	$1.0.10^{-7}$	$5.2.10^{-8}$	$3.4.10^{-8}$	$2.2.10^{-8}$
I-132		1.0	$3.0.10^{-9}$	1.0	$2.4.10^{-9}$	$1.3.10^{-9}$	$6.2.10^{-10}$	$4.1.10^{-10}$	$2.9.10^{-10}$
I-132m		1.0	$2.4.10^{-9}$	1.0	$2.0.10^{-9}$	$1.1.10^{-9}$	$5.0.10^{-10}$	$3.3.10^{-10}$	$2.2.10^{-10}$
I-133		1.0	$4.9.10^{-8}$	1.0	$4.4.10^{-8}$	$2.3.10^{-8}$	$1.0.10^{-8}$	$6.8.10^{-9}$	$4.3.10^{-9}$

Element		**f_1**	**h_{ing}[Sv/Bq]**	**f_1**	**h_{ing} [Sv/Bq]**				
Nuclide		**age < 1 year**		**≥ 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
I-134		1.0	$1.1.10^{-9}$	1.0	$7.5.10^{-10}$	$3.9.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
I-135		1.0	$1.0.10^{-8}$	1.0	$8.9.10^{-9}$	$4.7.10^{-9}$	$2.2.10^{-9}$	$1.4.10^{-9}$	$9.3.10^{-10}$
caesium									
Cs-125		1.0	$3.9.10^{-10}$	1.0	$2.2.10^{-10}$	$1.1.10^{-10}$	$6.5.10^{-11}$	$4.4.10^{-11}$	$3.5.10^{-11}$
Cs-127		1.0	$1.8.10^{-10}$	1.0	$1.2.10^{-10}$	$6.6.10^{-11}$	$4.2.10^{-11}$	$2.9.10^{-11}$	$2.4.10^{-11}$
Cs-129		1.0	$4.4.10^{-10}$	1.0	$3.0.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$7.2.10^{-11}$	$6.0.10^{-11}$
Cs-130		1.0	$3.3.10^{-10}$	1.0	$1.8.10^{-10}$	$9.0.10^{-11}$	$5.2.10^{-11}$	$3.6.10^{-11}$	$2.8.10^{-11}$
Cs-131		1.0	$4.6.10^{-10}$	1.0	$2.9.10^{-10}$	$1.6.10^{-10}$	$1.0.10^{-10}$	$6.9.10^{-11}$	$5.8.10^{-11}$
Cs-132		1.0	$2.7.10^{-9}$	1.0	$1.8.10^{-9}$	$1.1.10^{-9}$	$7.7.10^{-10}$	$5.7.10^{-10}$	$5.0.10^{-10}$
Cs-134		1.0	$2.6.10^{-8}$	1.0	$1.6.10^{-8}$	$1.3.10^{-8}$	$1.4.10^{-8}$	$1.9.10^{-8}$	$1.9.10^{-8}$
Cs-134m		1.0	$2.1.10^{-10}$	1.0	$1.2.10^{-10}$	$5.9.10^{-11}$	$3.5.10^{-11}$	$2.5.10^{-11}$	$2.0.10^{-11}$
Cs-135		1.0	$4.1.10^{-9}$	1.0	$2.3.10^{-9}$	$1.7.10^{-9}$	$1.7.10^{-9}$	$2.0.10^{-9}$	$2.0.10^{-9}$
Cs-135m		1.0	$1.3.10^{-10}$	1.0	$8.6.10^{-11}$	$4.9.10^{-11}$	$3.2.10^{-11}$	$2.3.10^{-11}$	$1.9.10^{-11}$
Cs-136		1.0	$1.5.10^{-8}$	1.0	$9.5.10^{-9}$	$6.1.10^{-9}$	$4.4.10^{-9}$	$3.4.10^{-9}$	$3.0.10^{-9}$
Cs-137		1.0	$2.1.10^{-8}$	1.0	$1.2.10^{-8}$	$9.6.10^{-9}$	$1.0.10^{-8}$	$1.3.10^{-8}$	$1.3.10^{-8}$
Cs-138		1.0	$1.1.10^{-9}$	1.0	$5.9.10^{-10}$	$2.9.10^{-10}$	$1.7.10^{-10}$	$1.2.10^{-10}$	$9.2.10^{-11}$
barium									
Ba-126		0.6	$2.7.10^{-9}$	0.3**	$1.7.10^{-9}$	$8.5.10^{-10}$	$5.0.10^{-10}$	$3.1.10^{-10}$	$2.6.10^{-10}$
Ba-128		0.6	$2.0.10^{-8}$	0.3**	$1.7.10^{-8}$	$9.0.10^{-9}$	$5.2.10^{-9}$	$3.0.10^{-9}$	$2.7.10^{-9}$
Ba-131		0.6	$4.2.10^{-9}$	0.3**	$2.6.10^{-9}$	$1.4.10^{-9}$	$9.4.10^{-10}$	$6.2.10^{-10}$	$4.5.10^{-10}$
Ba-131m		0.6	$5.8.10^{-11}$	0.3**	$3.2.10^{-11}$	$1.6.10^{-11}$	$9.3.10^{-12}$	$6.3.10^{-12}$	$4.9.10^{-12}$
Ba-133		0.6	$2.2.10^{-8}$	0.3**	$6.2.10^{-9}$	$3.9.10^{-9}$	$4.6.10^{-9}$	$7.3.10^{-9}$	$1.5.10^{-9}$
Ba-133m		0.6	$4.2.10^{-9}$	0.3**	$3.6.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$5.9.10^{-10}$	$5.4.10^{-10}$
Ba-135m		0.6	$3.3.10^{-9}$	0.3**	$2.9.10^{-9}$	$1.5.10^{-9}$	$8.5.10^{-10}$	$4.7.10^{-10}$	$4.3.10^{-10}$
Ba-139		0.6	$1.4.10^{-9}$	0.3**	$8.4.10^{-10}$	$4.1.10^{-10}$	$2.4.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
Ba-140		0.6	$3.2.10^{-8}$	0.3**	$1.8.10^{-8}$	$9.2.10^{-9}$	$5.8.10^{-9}$	$3.7.10^{-9}$	$2.6.10^{-9}$
Ba-141		0.6	$7.6.10^{-10}$	0.3**	$4.7.10^{-10}$	$2.3.10^{-10}$	$1.3.10^{-10}$	$8.6.10^{-11}$	$7.0.10^{-11}$
Ba-142		0.6	$3.6.10^{-10}$	0.3**	$2.2.10^{-10}$	$1.1.10^{-10}$	$6.6.10^{-11}$	$4.3.10^{-11}$	$3.5.10^{-11}$
lanthanum									
La-131		0.005	$3.5.10^{-10}$	$5.0.10^{-4}$	$2.1.10^{-10}$	$1.1.10^{-10}$	$6.6.10^{-11}$	$4.4.10^{-11}$	$3.5.10^{-11}$
La-132		0.005	$3.8.10^{-9}$	$5.0.10^{-4}$	$2.4.10^{-9}$	$1.3.10^{-9}$	$7.8.10^{-10}$	$4.8.10^{-10}$	$3.9.10^{-10}$
La-135		0.005	$2.8.10^{-10}$	$5.0.10^{-4}$	$1.9.10^{-10}$	$1.0.10^{-10}$	$6.4.10^{-11}$	$3.9.10^{-11}$	$3.0.10^{-11}$
La-137		0.005	$1.1.10^{-9}$	$5.0.10^{-4}$	$4.5.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$	$1.0.10^{-10}$	$8.1.10^{-11}$
La-138		0.005	$1.3.10^{-8}$	$5.0.10^{-4}$	$4.6.10^{-9}$	$2.7.10^{-9}$	$1.9.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$
La-140		0.005	$2.0.10^{-8}$	$5.0.10^{-4}$	$1.3.10^{-8}$	$6.8.10^{-9}$	$4.2.10^{-9}$	$2.5.10^{-9}$	$2.0.10^{-9}$
La-141		0.005	$4.3.10^{-9}$	$5.0.10^{-4}$	$2.6.10^{-9}$	$1.3.10^{-9}$	$7.6.10^{-10}$	$4.5.10^{-10}$	$3.6.10^{-10}$

Element		f_1	h_{ing}[Sv/Bq]	f_1	h_{ing} [Sv/Bq]				
Nuclide		age < 1 year		≥ 1 year	1 year	5 years	10 years	15 years	adult
La-142		0.005	$1.9.10^{-9}$	$5.0.10^{-4}$	$1.1.10^{-9}$	$5.8.10^{-10}$	$3.5.10^{-10}$	$2.3.10^{-10}$	$1.8.10^{-10}$
La-143		0.005	$6.9.10^{-10}$	$5.0.10^{-4}$	$3.9.10^{-10}$	$1.9.10^{-10}$	$1.1.10^{-10}$	$7.1.10^{-11}$	$5.6.10^{-11}$
cerium									
Ce-134		0.005	$2.8.10^{-8}$	$5.0.10^{-4}$	$1.8.10^{-8}$	$9.1.10^{-9}$	$5.5.10^{-9}$	$3.2.10^{-9}$	$2.5.10^{-9}$
Ce-135		0.005	$7.0.10^{-9}$	$5.0.10^{-4}$	$4.7.10^{-9}$	$2.6.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$7.9.10^{-10}$
Ce-137		0.005	$2.6.10^{-10}$	$5.0.10^{-4}$	$1.7.10^{-10}$	$8.8.10^{-11}$	$5.4.10^{-11}$	$3.2.10^{-11}$	$2.5.10^{-11}$
Ce-137m		0.005	$6.1.10^{-9}$	$5.0.10^{-4}$	$3.9.10^{-9}$	$2.0.10^{-9}$	$1.2.10^{-9}$	$6.8.10^{-10}$	$5.4.10^{-10}$
Ce-139		0.005	$2.6.10^{-9}$	$5.0.10^{-4}$	$1.6.10^{-9}$	$8.6.10^{-10}$	$5.4.10^{-10}$	$3.3.10^{-10}$	$2.6.10^{-10}$
Ce-141		0.005	$8.1.10^{-9}$	$5.0.10^{-4}$	$5.1.10^{-9}$	$2.6.10^{-9}$	$1.5.10^{-9}$	$8.8.10^{-10}$	$7.1.10^{-10}$
Ce-143		0.005	$1.2.10^{-8}$	$5.0.10^{-4}$	$8.0.10^{-9}$	$4.1.10^{-9}$	$2.4.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
Ce-144		0.005	$6.6.10^{-8}$	$5.0.10^{-4}$	$3.9.10^{-8}$	$1.9.10^{-8}$	$1.1.10^{-8}$	$6.5.10^{-9}$	$5.2.10^{-9}$
praseodymium									
Pr-136		0.005	$3.7.10^{-10}$	$5.0.10^{-4}$	$2.1.10^{-10}$	$1.0.10^{-10}$	$6.1.10^{-11}$	$4.2.10^{-11}$	$3.3.10^{-11}$
Pr-137		0.005	$4.1.10^{-10}$	$5.0.10^{-4}$	$2.5.10^{-10}$	$1.3.10^{-10}$	$7.7.10^{-11}$	$5.0.10^{-11}$	$4.0.10^{-11}$
Pr-138m		0.005	$1.0.10^{-9}$	$5.0.10^{-4}$	$7.4.10^{-10}$	$4.1.10^{-10}$	$2.6.10^{-10}$	$1.6.10^{-10}$	$1.3.10^{-10}$
Pr-139		0.005	$3.2.10^{-10}$	$5.0.10^{-4}$	$2.0.10^{-10}$	$1.1.10^{-10}$	$6.5.10^{-11}$	$4.0.10^{-11}$	$3.1.10^{-11}$
Pr-142		0.005	$1.5.10^{-8}$	$5.0.10^{-4}$	$9.8.10^{-9}$	$4.9.10^{-9}$	$2.9.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
Pr-142m		0.005	$2.0.10^{-10}$	$5.0.10^{-4}$	$1.2.10^{-10}$	$6.2.10^{-11}$	$3.7.10^{-11}$	$2.1.10^{-11}$	$1.7.10^{-11}$
Pr-143		0.005	$1.4.10^{-8}$	$5.0.10^{-4}$	$8.7.10^{-9}$	$4.3.10^{-9}$	$2.6.10^{-9}$	$1.5.10^{-9}$	$1.2.10^{-9}$
Pr-144		0.005	$6.4.10^{-10}$	$5.0.10^{-4}$	$3.5.10^{-10}$	$1.7.10^{-10}$	$9.5.10^{-11}$	$6.5.10^{-11}$	$5.0.10^{-11}$
Pr-145		0.005	$4.7.10^{-9}$	$5.0.10^{-4}$	$2.9.10^{-9}$	$1.4.10^{-9}$	$8.5.10^{-10}$	$4.9.10^{-10}$	$3.9.10^{-10}$
Pr-147		0.005	$3.9.10^{-10}$	$5.0.10^{-4}$	$2.2.10^{-10}$	$1.1.10^{-10}$	$6.1.10^{-11}$	$4.2.10^{-11}$	$3.3.10^{-11}$
neodymium									
Nd-136		0.005	$1.0.10^{-9}$	$5.0.10^{-4}$	$6.1.10^{-10}$	$3.1.10^{-10}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$9.9.10^{-11}$
Nd-138		0.005	$7.2.10^{-9}$	$5.0.10^{-4}$	$4.5.10^{-9}$	$2.3.10^{-9}$	$1.3.10^{-9}$	$8.0.10^{-10}$	$6.4.10^{-10}$
Nd-139		0.005	$2.1.10^{-10}$	$5.0.10^{-4}$	$1.2.10^{-10}$	$6.3.10^{-11}$	$3.7.10^{-11}$	$2.5.10^{-11}$	$2.0.10^{-11}$
Nd-139m		0.005	$2.1.10^{-9}$	$5.0.10^{-4}$	$1.4.10^{-9}$	$7.8.10^{-10}$	$5.0.10^{-10}$	$3.1.10^{-10}$	$2.5.10^{-10}$
Nd-141		0.005	$7.8.10^{-11}$	$5.0.10^{-4}$	$5.0.10^{-11}$	$2.7.10^{-11}$	$1.6.10^{-11}$	$1.0.10^{-11}$	$8.3.10^{-12}$
Nd-147		0.005	$1.2.10^{-8}$	$5.0.10^{-4}$	$7.8.10^{-9}$	$3.9.10^{-9}$	$2.3.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$
Nd-149		0.005	$1.4.10^{-9}$	$5.0.10^{-4}$	$8.7.10^{-10}$	$4.3.10^{-10}$	$2.6.10^{-10}$	$1.6.10^{-10}$	$1.2.10^{-10}$
Nd-151		0.005	$3.4.10^{-10}$	$5.0.10^{-4}$	$2.0.10^{-10}$	$9.7.10^{-11}$	$5.7.10^{-11}$	$3.8.10^{-11}$	$3.0.10^{-11}$
promethium									
Pm-141		0.005	$4.2.10^{-10}$	$5.0.10^{-4}$	$2.4.10^{-10}$	$1.2.10^{-10}$	$6.8.10^{-11}$	$4.6.10^{-11}$	$3.6.10^{-11}$
Pm-143		0.005	$1.9.10^{-9}$	$5.0.10^{-4}$	$1.2.10^{-9}$	$6.7.10^{-10}$	$4.4.10^{-10}$	$2.9.10^{-10}$	$2.3.10^{-10}$
Pm-144		0.005	$7.6.10^{-9}$	$5.0.10^{-4}$	$4.7.10^{-9}$	$2.7.10^{-9}$	$1.8.10^{-9}$	$1.2.10^{-9}$	$9.7.10^{-10}$
Pm-145		0.005	$1.5.10^{-9}$	$5.0.10^{-4}$	$6.8.10^{-10}$	$3.7.10^{-10}$	$2.3.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$

Element		**f_1**	**h_{ing}[Sv/Bq]**	**f_1**	**h_{ing} [Sv/Bq]**				
Nuclide		**age < 1 year**		**≥ 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Pm-146		0.005	$1.0.10^{-8}$	$5.0.10^{-4}$	$5.1.10^{-9}$	$2.8.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$9.0.10^{-10}$
Pm-147		0.005	$3.6.10^{-9}$	$5.0.10^{-4}$	$1.9.10^{-9}$	$9.6.10^{-10}$	$5.7.10^{-10}$	$3.2.10^{-10}$	$2.6.10^{-10}$
Pm-148		0.005	$3.0.10^{-8}$	$5.0.10^{-4}$	$1.9.10^{-8}$	$9.7.10^{-9}$	$5.8.10^{-9}$	$3.3.10^{-9}$	$2.7.10^{-9}$
Pm-148m		0.005	$1.5.10^{-8}$	$5.0.10^{-4}$	$1.0.10^{-8}$	$5.5.10^{-9}$	$3.5.10^{-9}$	$2.2.10^{-9}$	$1.7.10^{-9}$
Pm-149		0.005	$1.2.10^{-8}$	$5.0.10^{-4}$	$7.4.10^{-9}$	$3.7.10^{-9}$	$2.2.10^{-9}$	$1.2.10^{-9}$	$9.9.10^{-10}$
Pm-150		0.005	$2.8.10^{-9}$	$5.0.10^{-4}$	$1.7.10^{-9}$	$8.7.10^{-10}$	$5.2.10^{-10}$	$3.2.10^{-10}$	$2.6.10^{-10}$
Pm-151		0.005	$8.0.10^{-9}$	$5.0.10^{-4}$	$5.1.10^{-9}$	$2.6.10^{-9}$	$1.6.10^{-9}$	$9.1.10^{-10}$	$7.3.10^{-10}$
samarium									
Sm-141		0.005	$4.5.10^{-10}$	$5.0.10^{-4}$	$2.5.10^{-10}$	$1.3.10^{-10}$	$7.3.10^{-11}$	$5.0.10^{-11}$	$3.9.10^{-11}$
Sm-141m		0.005	$7.0.10^{-10}$	$5.0.10^{-4}$	$4.0.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$8.2.10^{-11}$	$6.5.10^{-11}$
Sm-142		0.005	$2.2.10^{-9}$	$5.0.10^{-4}$	$1.3.10^{-9}$	$6.2.10^{-10}$	$3.6.10^{-10}$	$2.4.10^{-10}$	$1.9.10^{-10}$
Sm-145		0.005	$2.4.10^{-9}$	$5.0.10^{-4}$	$1.4.10^{-9}$	$7.3.10^{-10}$	$4.5.10^{-10}$	$2.7.10^{-10}$	$2.1.10^{-10}$
Sm-146		0.005	$1.5.10^{-6}$	$5.0.10^{-4}$	$1.5.10^{-7}$	$1.0.10^{-7}$	$7.0.10^{-8}$	$5.8.10^{-8}$	$5.4.10^{-8}$
Sm-147		0.005	$1.4.10^{-6}$	$5.0.10^{-4}$	$1.4.10^{-7}$	$9.2.10^{-8}$	$6.4.10^{-8}$	$5.2.10^{-8}$	$4.9.10^{-8}$
Sm-151		0.005	$1.5.10^{-9}$	$5.0.10^{-4}$	$6.4.10^{-10}$	$3.3.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$9.8.10^{-11}$
Sm-153		0.005	$8.4.10^{-9}$	$5.0.10^{-4}$	$5.4.10^{-9}$	$2.7.10^{-9}$	$1.6.10^{-9}$	$9.2.10^{-10}$	$7.4.10^{-10}$
Sm-155		0.005	$3.6.10^{-10}$	$5.0.10^{-4}$	$2.0.10^{-10}$	$9.7.10^{-11}$	$5.5.10^{-11}$	$3.7.10^{-11}$	$2.9.10^{-11}$
Sm-156		0.005	$2.8.10^{-9}$	$5.0.10^{-4}$	$1.8.10^{-9}$	$9.0.10^{-10}$	$5.4.10^{-10}$	$3.1.10^{-10}$	$2.5.10^{-10}$
europium									
Eu-145		0.005	$5.1.10^{-9}$	$5.0.10^{-4}$	$3.7.10^{-9}$	$2.1.10^{-9}$	$1.4.10^{-9}$	$9.4.10^{-10}$	$7.5.10^{-10}$
Eu-146		0.005	$8.5.10^{-9}$	$5.0.10^{-4}$	$6.2.10^{-9}$	$3.6.10^{-9}$	$2.4.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
Eu-147		0.005	$3.7.10^{-9}$	$5.0.10^{-4}$	$2.5.10^{-9}$	$1.4.10^{-9}$	$8.9.10^{-10}$	$5.6.10^{-10}$	$4.4.10^{-10}$
Eu-148		0.005	$8.5.10^{-9}$	$5.0.10^{-4}$	$6.0.10^{-9}$	$3.5.10^{-9}$	$2.4.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
Eu-149		0.005	$9.7.10^{-10}$	$5.0.10^{-4}$	$6.3.10^{-10}$	$3.4.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$1.0.10^{-10}$
Eu-150		0.005	$1.3.10^{-8}$	$5.0.10^{-4}$	$5.7.10^{-9}$	$3.4.10^{-9}$	$2.3.10^{-9}$	$1.5.10^{-9}$	$1.3.10^{-9}$
Eu-150m		0.005	$4.4.10^{-9}$	$5.0.10^{-4}$	$2.8.10^{-9}$	$1.4.10^{-9}$	$8.2.10^{-10}$	$4.7.10^{-10}$	$3.8.10^{-10}$
Eu-152		0.005	$1.6.10^{-8}$	$5.0.10^{-4}$	$7.4.10^{-9}$	$4.1.10^{-9}$	$2.6.10^{-9}$	$1.7.10^{-9}$	$1.4.10^{-9}$
Eu-152m		0.005	$5.7.10^{-9}$	$5.0.10^{-4}$	$3.6.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$6.2.10^{-10}$	$5.0.10^{-10}$
Eu-154		0.005	$2.5.10^{-8}$	$5.0.10^{-4}$	$1.2.10^{-8}$	$6.5.10^{-9}$	$4.1.10^{-9}$	$2.5.10^{-9}$	$2.0.10^{-9}$
Eu-155		0.005	$4.3.10^{-9}$	$5.0.10^{-4}$	$2.2.10^{-9}$	$1.1.10^{-9}$	$6.8.10^{-10}$	$4.0.10^{-10}$	$3.2.10^{-10}$
Eu-156		0.005	$2.2.10^{-8}$	$5.0.10^{-4}$	$1.5.10^{-8}$	$7.5.10^{-9}$	$4.6.10^{-9}$	$2.7.10^{-9}$	$2.2.10^{-9}$
Eu-157		0.005	$6.7.10^{-9}$	$5.0.10^{-4}$	$4.3.10^{-9}$	$2.2.10^{-9}$	$1.3.10^{-9}$	$7.5.10^{-10}$	$6.0.10^{-10}$
Eu-158		0.005	$1.1.10^{-9}$	$5.0.10^{-4}$	$6.2.10^{-10}$	$3.1.10^{-10}$	$1.8.10^{-10}$	$1.2.10^{-10}$	$9.4.10^{-11}$
gadolinium									
Gd-145		0.005	$4.5.10^{-10}$	$5.0.10^{-4}$	$2.6.10^{-10}$	$1.3.10^{-10}$	$8.1.10^{-11}$	$5.6.10^{-11}$	$4.4.10^{-11}$
Gd-146		0.005	$9.4.10^{-9}$	$5.0.10^{-4}$	$6.0.10^{-9}$	$3.2.10^{-9}$	$2.0.10^{-9}$	$1.2.10^{-9}$	$9.6.10^{-10}$

Element		**f_1**	**h_{ing}[Sv/Bq]**	**f_1**	**h_{ing} [Sv/Bq]**				
Nuclide		**age < 1 year**		**≥ 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Gd-147		0.005	$4.5.10^{-9}$	$5.0.10^{-4}$	$3.2.10^{-9}$	$1.8.10^{-9}$	$1.2.10^{-9}$	$7.7.10^{-10}$	$6.1.10^{-10}$
Gd-148		0.005	$1.7.10^{-6}$	$5.0.10^{-4}$	$1.6.10^{-7}$	$1.1.10^{-7}$	$7.3.10^{-8}$	$5.9.10^{-8}$	$5.6.10^{-8}$
Gd-149		0.005	$4.0.10^{-9}$	$5.0.10^{-4}$	$2.7.10^{-9}$	$1.5.10^{-9}$	$9.3.10^{-10}$	$5.7.10^{-10}$	$4.5.10^{-10}$
Gd-151		0.005	$2.1.10^{-9}$	$5.0.10^{-4}$	$1.3.10^{-9}$	$6.8.10^{-10}$	$4.2.10^{-10}$	$2.4.10^{-10}$	$2.0.10^{-10}$
Gd-152		0.005	$1.2.10^{-6}$	$5.0.10^{-4}$	$1.2.10^{-7}$	$7.7.10^{-8}$	$5.3.10^{-8}$	$4.3.10^{-8}$	$4.1.10^{-8}$
Gd-153		0.005	$2.9.10^{-9}$	$5.0.10^{-4}$	$1.8.10^{-9}$	$9.4.10^{-10}$	$5.8.10^{-10}$	$3.4.10^{-10}$	$2.7.10^{-10}$
Gd-159		0.005	$5.7.10^{-9}$	$5.0.10^{-4}$	$3.6.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$6.2.10^{-10}$	$4.9.10^{-10}$
terbium									
Tb-147		0.005	$1.5.10^{-9}$	$5.0.10^{-4}$	$1.0.10^{-9}$	$5.4.10^{-10}$	$3.3.10^{-10}$	$2.0.10^{-10}$	$1.6.10^{-10}$
Tb-149		0.005	$2.4.10^{-9}$	$5.0.10^{-4}$	$1.5.10^{-9}$	$8.0.10^{-10}$	$5.0.10^{-10}$	$3.1.10^{-10}$	$2.5.10^{-10}$
Tb-150		0.005	$2.5.10^{-9}$	$5.0.10^{-4}$	$1.6.10^{-9}$	$8.3.10^{-10}$	$5.1.10^{-10}$	$3.2.10^{-10}$	$2.5.10^{-10}$
Tb-151		0.005	$2.7.10^{-9}$	$5.0.10^{-4}$	$1.9.10^{-9}$	$1.0.10^{-9}$	$6.7.10^{-10}$	$4.2.10^{-10}$	$3.4.10^{-10}$
Tb-153		0.005	$2.3.10^{-9}$	$5.0.10^{-4}$	$1.5.10^{-9}$	$8.2.10^{-10}$	$5.1.10^{-10}$	$3.1.10^{-10}$	$2.5.10^{-10}$
Tb-154		0.005	$4.7.10^{-9}$	$5.0.10^{-4}$	$3.4.10^{-9}$	$1.9.10^{-9}$	$1.3.10^{-9}$	$8.1.10^{-10}$	$6.5.10^{-10}$
Tb-155		0.005	$1.9.10^{-9}$	$5.0.10^{-4}$	$1.3.10^{-9}$	$6.8.10^{-10}$	$4.3.10^{-10}$	$2.6.10^{-10}$	$2.1.10^{-10}$
Tb-156		0.005	$9.0.10^{-9}$	$5.0.10^{-4}$	$6.3.10^{-9}$	$3.5.10^{-9}$	$2.3.10^{-9}$	$1.5.10^{-9}$	$1.2.10^{-9}$
Tb-156m		0.005	$1.5.10^{-9}$	$5.0.10^{-4}$	$1.0.10^{-9}$	$5.6.10^{-10}$	$3.5.10^{-10}$	$2.2.10^{-10}$	$1.7.10^{-10}$
Tb-156m’		0.005	$8.0.10^{-10}$	$5.0.10^{-4}$	$5.2.10^{-10}$	$2.7.10^{-10}$	$1.7.10^{-10}$	$1.0.10^{-10}$	$8.1.10^{-11}$
Tb-157		0.005	$4.9.10^{-10}$	$5.0.10^{-4}$	$2.2.10^{-10}$	$1.1.10^{-10}$	$6.8.10^{-11}$	$4.1.10^{-11}$	$3.4.10^{-11}$
Tb-158		0.005	$1.3.10^{-8}$	$5.0.10^{-4}$	$5.9.10^{-9}$	$3.3.10^{-9}$	$2.1.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
Tb-160		0.005	$1.6.10^{-8}$	$5.0.10^{-4}$	$1.0.10^{-8}$	$5.4.10^{-9}$	$3.3.10^{-9}$	$2.0.10^{-9}$	$1.6.10^{-9}$
Tb-161		0.005	$8.3.10^{-9}$	$5.0.10^{-4}$	$5.3.10^{-9}$	$2.7.10^{-9}$	$1.6.10^{-9}$	$9.0.10^{-10}$	$7.2.10^{-10}$
dysprosium									
Dy-155		0.005	$9.7.10^{-10}$	$5.0.10^{-4}$	$6.8.10^{-10}$	$3.8.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$	$1.3.10^{-10}$
Dy-157		0.005	$4.4.10^{-10}$	$5.0.10^{-4}$	$3.1.10^{-10}$	$1.8.10^{-10}$	$1.2.10^{-10}$	$7.7.10^{-11}$	$6.1.10^{-11}$
Dy-159		0.005	$1.0.10^{-9}$	$5.0.10^{-4}$	$6.4.10^{-10}$	$3.4.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$1.0.10^{-10}$
Dy-165		0.005	$1.3.10^{-9}$	$5.0.10^{-4}$	$7.9.10^{-10}$	$3.9.10^{-10}$	$2.3.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
Dy-166		0.005	$1.9.10^{-8}$	$5.0.10^{-4}$	$1.2.10^{-8}$	$6.0.10^{-9}$	$3.6.10^{-9}$	$2.0.10^{-9}$	$1.6.10^{-9}$
holmium									
Ho-155		0.005	$3.8.10^{-10}$	$5.0.10^{-4}$	$2.3.10^{-10}$	$1.2.10^{-10}$	$7.1.10^{-11}$	$4.7.10^{-11}$	$3.7.10^{-11}$
Ho-157		0.005	$5.8.10^{-11}$	$5.0.10^{-4}$	$3.6.10^{-11}$	$1.9.10^{-11}$	$1.2.10^{-11}$	$8.1.10^{-12}$	$6.5.10^{-12}$
Ho-159		0.005	$7.1.10^{-11}$	$5.0.10^{-4}$	$4.3.10^{-11}$	$2.3.10^{-11}$	$1.4.10^{-11}$	$9.9.10^{-12}$	$7.9.10^{-12}$
Ho-161		0.005	$1.4.10^{-10}$	$5.0.10^{-4}$	$8.1.10^{-11}$	$4.2.10^{-11}$	$2.5.10^{-11}$	$1.6.10^{-11}$	$1.3.10^{-11}$
Ho-162		0.005	$3.5.10^{-11}$	$5.0.10^{-4}$	$2.0.10^{-11}$	$1.0.10^{-11}$	$6.0.10^{-12}$	$4.2.10^{-12}$	$3.3.10^{-12}$
Ho-162m		0.005	$2.4.10^{-10}$	$5.0.10^{-4}$	$1.5.10^{-10}$	$7.9.10^{-11}$	$4.9.10^{-11}$	$3.3.10^{-11}$	$2.6.10^{-11}$
Ho-164		0.005	$1.2.10^{-10}$	$5.0.10^{-4}$	$6.5.10^{-11}$	$3.2.10^{-11}$	$1.8.10^{-11}$	$1.2.10^{-11}$	$9.5.10^{-12}$

Element		f_1	h_{ing}[Sv/Bq]	f_1	h_{ing} [Sv/Bq]				
Nuclide		**age < 1 year**		**≥ 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Ho-164m		0.005	$2.0.10^{-10}$	$5.0.10^{-4}$	$1.1.10^{-10}$	$5.5.10^{-11}$	$3.2.10^{-11}$	$2.1.10^{-11}$	$1.6.10^{-11}$
Ho-166		0.005	$1.6.10^{-8}$	$5.0.10^{-4}$	$1.0.10^{-8}$	$5.2.10^{-9}$	$3.1.10^{-9}$	$1.7.10^{-9}$	$1.4.10^{-9}$
Ho-166m		0.005	$2.6.10^{-8}$	$5.0.10^{-4}$	$9.3.10^{-9}$	$5.3.10^{-9}$	$3.5.10^{-9}$	$2.4.10^{-9}$	$2.0.10^{-9}$
Ho-167		0.005	$8.8.10^{-10}$	$5.0.10^{-4}$	$5.5.10^{-10}$	$2.8.10^{-10}$	$1.7.10^{-10}$	$1.0.10^{-10}$	$8.3.10^{-11}$
erbium									
Er-161		0.005	$6.5.10^{-10}$	$5.0.10^{-4}$	$4.4.10^{-10}$	$2.4.10^{-10}$	$1.6.10^{-10}$	$1.0.10^{-10}$	$8.0.10^{-11}$
Er-165		0.005	$1.7.10^{-10}$	$5.0.10^{-4}$	$1.1.10^{-10}$	$6.2.10^{-11}$	$3.9.10^{-11}$	$2.4.10^{-11}$	$1.9.10^{-11}$
Er-169		0.005	$4.4.10^{-9}$	$5.0.10^{-4}$	$2.8.10^{-9}$	$1.4.10^{-9}$	$8.2.10^{-10}$	$4.7.10^{-10}$	$3.7.10^{-10}$
Er-171		0.005	$4.0.10^{-9}$	$5.0.10^{-4}$	$2.5.10^{-9}$	$1.3.10^{-9}$	$7.6.10^{-10}$	$4.5.10^{-10}$	$3.6.10^{-10}$
Er-172		0.005	$1.0.10^{-8}$	$5.0.10^{-4}$	$6.8.10^{-9}$	$3.5.10^{-9}$	$2.1.10^{-9}$	$1.3.10^{-9}$	$1.0.10^{-9}$
thulium									
Tm-162		0.005	$2.9.10^{-10}$	$5.0.10^{-4}$	$1.7.10^{-10}$	$8.7.10^{-11}$	$5.2.10^{-11}$	$3.6.10^{-11}$	$2.9.10^{-11}$
Tm-166		0.005	$2.1.10^{-9}$	$5.0.10^{-4}$	$1.5.10^{-9}$	$8.3.10^{-10}$	$5.5.10^{-10}$	$3.5.10^{-10}$	$2.8.10^{-10}$
Tm-167		0.005	$6.0.10^{-9}$	$5.0.10^{-4}$	$3.9.10^{-9}$	$2.0.10^{-9}$	$1.2.10^{-9}$	$7.0.10^{-10}$	$5.6.10^{-10}$
Tm-170		0.005	$1.6.10^{-8}$	$5.0.10^{-4}$	$9.8.10^{-9}$	$4.9.10^{-9}$	$2.9.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
Tm-171		0.005	$1.5.10^{-9}$	$5.0.10^{-4}$	$7.8.10^{-10}$	$3.9.10^{-10}$	$2.3.10^{-10}$	$1.3.10^{-10}$	$1.1.10^{-10}$
Tm-172		0.005	$1.9.10^{-8}$	$5.0.10^{-4}$	$1.2.10^{-8}$	$6.1.10^{-9}$	$3.7.10^{-9}$	$2.1.10^{-9}$	$1.7.10^{-9}$
Tm-173		0.005	$3.3.10^{-9}$	$5.0.10^{-4}$	$2.1.10^{-9}$	$1.1.10^{-9}$	$6.5.10^{-10}$	$3.8.10^{-10}$	$3.1.10^{-10}$
Tm-175		0.005	$3.1.10^{-10}$	$5.0.10^{-4}$	$1.7.10^{-10}$	$8.6.10^{-11}$	$5.0.10^{-11}$	$3.4.10^{-11}$	$2.7.10^{-11}$
ytterbium									
Yb-162		0.005	$2.2.10^{-10}$	$5.0.10^{-4}$	$1.3.10^{-10}$	$6.9.10^{-11}$	$4.2.10^{-11}$	$2.9.10^{-11}$	$2.3.10^{-11}$
Yb-166		0.005	$7.7.10^{-9}$	$5.0.10^{-4}$	$5.4.10^{-9}$	$2.9.10^{-9}$	$1.9.10^{-9}$	$1.2.10^{-9}$	$9.5.10^{-10}$
Yb-167		0.005	$7.0.10^{-11}$	$5.0.10^{-4}$	$4.1.10^{-11}$	$2.1.10^{-11}$	$1.2.10^{-11}$	$8.4.10^{-12}$	$6.7.10^{-12}$
Yb-169		0.005	$7.1.10^{-9}$	$5.0.10^{-4}$	$4.6.10^{-9}$	$2.4.10^{-9}$	$1.5.10^{-9}$	$8.8.10^{-10}$	$7.1.10^{-10}$
Yb-175		0.005	$5.0.10^{-9}$	$5.0.10^{-4}$	$3.2.10^{-9}$	$1.6.10^{-9}$	$9.5.10^{-10}$	$5.4.10^{-10}$	$4.4.10^{-10}$
Yb-177		0.005	$1.0.10^{-9}$	$5.0.10^{-4}$	$6.8.10^{-10}$	$3.4.10^{-10}$	$2.0.10^{-10}$	$1.1.10^{-10}$	$8.8.10^{-11}$
Yb-178		0.005	$1.4.10^{-9}$	$5.0.10^{-4}$	$8.4.10^{-10}$	$4.2.10^{-10}$	$2.4.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
lutetium									
Lu-169		0.005	$3.5.10^{-9}$	$5.0.10^{-4}$	$2.4.10^{-9}$	$1.4.10^{-9}$	$8.9.10^{-10}$	$5.7.10^{-10}$	$4.6.10^{-10}$
Lu-170		0.005	$7.4.10^{-9}$	$5.0.10^{-4}$	$5.2.10^{-9}$	$2.9.10^{-9}$	$1.9.10^{-9}$	$1.2.10^{-9}$	$9.9.10^{-10}$
Lu-171		0.005	$5.9.10^{-9}$	$5.0.10^{-4}$	$4.0.10^{-9}$	$2.2.10^{-9}$	$1.4.10^{-9}$	$8.5.10^{-10}$	$6.7.10^{-10}$
Lu-172		0.005	$1.0.10^{-8}$	$5.0.10^{-4}$	$7.0.10^{-9}$	$3.9.10^{-9}$	$2.5.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
Lu-173		0.005	$2.7.10^{-9}$	$5.0.10^{-4}$	$1.6.10^{-9}$	$8.6.10^{-10}$	$5.3.10^{-10}$	$3.2.10^{-10}$	$2.6.10^{-10}$
Lu-174		0.005	$3.2.10^{-9}$	$5.0.10^{-4}$	$1.7.10^{-9}$	$9.1.10^{-10}$	$5.6.10^{-10}$	$3.3.10^{-10}$	$2.7.10^{-10}$
Lu-174m		0.005	$6.2.10^{-9}$	$5.0.10^{-4}$	$3.8.10^{-9}$	$1.9.10^{-9}$	$1.1.10^{-9}$	$6.6.10^{-10}$	$5.3.10^{-10}$
Lu-176		0.005	$2.4.10^{-8}$	$5.0.10^{-4}$	$1.1.10^{-8}$	$5.7.10^{-9}$	$3.5.10^{-9}$	$2.2.10^{-9}$	$1.8.10^{-9}$

Element		**f_1**	**h_{ing}[Sv/Bq]**	**f_1**	**h_{ing} [Sv/Bq]**				
Nuclide		**age < 1 year**		**≥ 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Lu-176m		0.005	$2.0.10^{-9}$	$5.0.10^{-4}$	$1.2.10^{-9}$	$6.0.10^{-10}$	$3.5.10^{-10}$	$2.1.10^{-10}$	$1.7.10^{-10}$
Lu-177		0.005	$6.1.10^{-9}$	$5.0.10^{-4}$	$3.9.10^{-9}$	$2.0.10^{-9}$	$1.2.10^{-9}$	$6.6.10^{-10}$	$5.3.10^{-10}$
Lu-177m		0.005	$1.7.10^{-8}$	$5.0.10^{-4}$	$1.1.10^{-8}$	$5.8.10^{-9}$	$3.6.10^{-9}$	$2.1.10^{-9}$	$1.7.10^{-9}$
Lu-178		0.005	$5.9.10^{-10}$	$5.0.10^{-4}$	$3.3.10^{-10}$	$1.6.10^{-10}$	$9.0.10^{-11}$	$6.1.10^{-11}$	$4.7.10^{-11}$
Lu-178m		0.005	$4.3.10^{-10}$	$5.0.10^{-4}$	$2.4.10^{-10}$	$1.2.10^{-10}$	$7.1.10^{-11}$	$4.9.10^{-11}$	$3.8.10^{-11}$
Lu-179		0.005	$2.4.10^{-9}$	$5.0.10^{-4}$	$1.5.10^{-9}$	$7.5.10^{-10}$	$4.4.10^{-10}$	$2.6.10^{-10}$	$2.1.10^{-10}$
hafnium									
Hf-170		0.02	$3.9.10^{-9}$	0.002	$2.7.10^{-9}$	$1.5.10^{-9}$	$9.5.10^{-10}$	$6.0.10^{-10}$	$4.8.10^{-10}$
Hf-172		0.02	$1.9.10^{-8}$	0.002	$6.1.10^{-9}$	$3.3.10^{-9}$	$2.0.10^{-9}$	$1.3.10^{-9}$	$1.0.10^{-9}$
Hf-173		0.02	$1.9.10^{-9}$	0.002	$1.3.10^{-9}$	$7.2.10^{-10}$	$4.6.10^{-10}$	$2.8.10^{-10}$	$2.3.10^{-10}$
Hf-175		0.02	$3.8.10^{-9}$	0.002	$2.4.10^{-9}$	$1.3.10^{-9}$	$8.4.10^{-10}$	$5.2.10^{-10}$	$4.1.10^{-10}$
Hf-177m		0.02	$7.8.10^{-10}$	0.002	$4.7.10^{-10}$	$2.5.10^{-10}$	$1.5.10^{-10}$	$1.0.10^{-10}$	$8.1.10^{-11}$
Hf-178m		0.02	$7.0.10^{-8}$	0.002	$1.9.10^{-8}$	$1.1.10^{-8}$	$7.8.10^{-9}$	$5.5.10^{-9}$	$4.7.10^{-9}$
Hf-179m		0.02	$1.2.10^{-8}$	0.002	$7.8.10^{-9}$	$4.1.10^{-9}$	$2.6.10^{-9}$	$1.6.10^{-9}$	$1.2.10^{-9}$
Hf-180m		0.02	$1.4.10^{-9}$	0.002	$9.7.10^{-10}$	$5.3.10^{-10}$	$3.3.10^{-10}$	$2.1.10^{-10}$	$1.7.10^{-10}$
Hf-181		0.02	$1.2.10^{-8}$	0.002	$7.4.10^{-9}$	$3.8.10^{-9}$	$2.3.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
Hf-182		0.02	$5.6.10^{-8}$	0.002	$7.9.10^{-9}$	$5.4.10^{-9}$	$4.0.10^{-9}$	$3.3.10^{-9}$	$3.0.10^{-9}$
Hf-182m		0.02	$4.1.10^{-10}$	0.002	$2.5.10^{-10}$	$1.3.10^{-10}$	$7.8.10^{-11}$	$5.2.10^{-11}$	$4.2.10^{-11}$
Hf-183		0.02	$8.1.10^{-10}$	0.002	$4.8.10^{-10}$	$2.4.10^{-10}$	$1.4.10^{-10}$	$9.3.10^{-11}$	$7.3.10^{-11}$
Hf-184		0.02	$5.5.10^{-9}$	0.002	$3.6.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$6.6.10^{-10}$	$5.2.10^{-10}$
tantalum									
Ta-172		0.01	$5.5.10^{-10}$	0.001	$3.2.10^{-10}$	$1.6.10^{-10}$	$9.8.10^{-11}$	$6.6.10^{-11}$	$5.3.10^{-11}$
Ta-173		0.01	$2.0.10^{-9}$	0.001	$1.3.10^{-9}$	$6.5.10^{-10}$	$3.9.10^{-10}$	$2.4.10^{-10}$	$1.9.10^{-10}$
Ta-174		0.01	$6.2.10^{-10}$	0.001	$3.7.10^{-10}$	$1.9.10^{-10}$	$1.1.10^{-10}$	$7.2.10^{-11}$	$5.7.10^{-11}$
Ta-175		0.01	$1.6.10^{-9}$	0.001	$1.1.10^{-9}$	$6.2.10^{-10}$	$4.0.10^{-10}$	$2.6.10^{-10}$	$2.1.10^{-10}$
Ta-176		0.01	$2.4.10^{-9}$	0.001	$1.7.10^{-9}$	$9.2.10^{-10}$	$6.1.10^{-10}$	$3.9.10^{-10}$	$3.1.10^{-10}$
Ta-177		0.01	$1.0.10^{-9}$	0.001	$6.9.10^{-10}$	$3.6.10^{-10}$	$2.2.10^{-10}$	$1.3.10^{-10}$	$1.1.10^{-10}$
Ta-178m		0.01	$6.3.10^{-10}$	0.001	$4.5.10^{-10}$	$2.4.10^{-10}$	$1.5.10^{-10}$	$9.1.10^{-11}$	$7.2.10^{-11}$
Ta-179		0.01	$6.2.10^{-10}$	0.001	$4.1.10^{-10}$	$2.2.10^{-10}$	$1.3.10^{-10}$	$8.1.10^{-11}$	$6.5.10^{-11}$
Ta-180		0.01	$5.8.10^{-10}$	0.001	$3.7.10^{-10}$	$1.9.10^{-10}$	$1.1.10^{-10}$	$6.7.10^{-11}$	$5.4.10^{-11}$
Ta-182		0.01	$1.4.10^{-8}$	0.001	$9.4.10^{-9}$	$5.0.10^{-9}$	$3.1.10^{-9}$	$1.9.10^{-9}$	$1.5.10^{-9}$
Ta-182m		0.01	$1.4.10^{-10}$	0.001	$7.5.10^{-11}$	$3.7.10^{-11}$	$2.1.10^{-11}$	$1.5.10^{-11}$	$1.2.10^{-11}$
Ta-183		0.01	$1.4.10^{-8}$	0.001	$9.3.10^{-9}$	$4.7.10^{-9}$	$2.8.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
Ta-184		0.01	$6.7.10^{-9}$	0.001	$4.4.10^{-9}$	$2.3.10^{-9}$	$1.4.10^{-9}$	$8.5.10^{-10}$	$6.8.10^{-10}$
Ta-185		0.01	$8.3.10^{-10}$	0.001	$4.6.10^{-10}$	$2.3.10^{-10}$	$1.3.10^{-10}$	$8.6.10^{-11}$	$6.8.10^{-11}$
Ta-186		0.01	$3.8.10^{-10}$	0.001	$2.1.10^{-10}$	$1.1.10^{-10}$	$6.1.10^{-11}$	$4.2.10^{-11}$	$3.3.10^{-11}$

Element		**f_1**	**h_{ing}[Sv/Bq]**	**f_1**	**h_{ing} [Sv/Bq]**				
Nuclide		**age < 1 year**		**≥ 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
wolfram									
W-176		0.6	$6.8.10^{-10}$	0.3	$5.5.10^{-10}$	$3.0.10^{-10}$	$2.0.10^{-10}$	$1.3.10^{-10}$	$1.0.10^{-10}$
W-177		0.6	$4.4.10^{-10}$	0.3	$3.2.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$7.2.10^{-11}$	$5.8.10^{-11}$
W-178		0.6	$1.8.10^{-9}$	0.3	$1.4.10^{-9}$	$7.3.10^{-10}$	$4.5.10^{-10}$	$2.7.10^{-10}$	$2.2.10^{-10}$
W-179		0.6	$3.4.10^{-11}$	0.3	$2.0.10^{-11}$	$1.0.10^{-11}$	$6.2.10^{-12}$	$4.2.10^{-12}$	$3.3.10^{-12}$
W-181		0.6	$6.3.10^{-10}$	0.3	$4.7.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$	$9.5.10^{-11}$	$7.6.10^{-11}$
W-185		0.6	$4.4.10^{-9}$	0.3	$3.3.10^{-9}$	$1.6.10^{-9}$	$9.7.10^{-10}$	$5.5.10^{-10}$	$4.4.10^{-10}$
W-187		0.6	$5.5.10^{-9}$	0.3	$4.3.10^{-9}$	$2.2.10^{-9}$	$1.3.10^{-9}$	$7.8.10^{-10}$	$6.3.10^{-10}$
W-188		0.6	$2.1.10^{-8}$	0.3	$1.5.10^{-8}$	$7.7.10^{-9}$	$4.6.10^{-9}$	$2.6.10^{-9}$	$2.1.10^{-9}$
rhenium									
Re-177		1.0	$2.5.10^{-10}$	0.8	$1.4.10^{-10}$	$7.2.10^{-11}$	$4.1.10^{-11}$	$2.8.10^{-11}$	$2.2.10^{-11}$
Re-178		1.0	$2.9.10^{-10}$	0.8	$1.6.10^{-10}$	$7.9.10^{-11}$	$4.6.10^{-11}$	$3.1.10^{-11}$	$2.5.10^{-11}$
Re-181		1.0	$4.2.10^{-9}$	0.8	$2.8.10^{-9}$	$1.4.10^{-9}$	$8.2.10^{-10}$	$5.4.10^{-10}$	$4.2.10^{-10}$
Re-182		1.0	$1.4.10^{-8}$	0.8	$8.9.10^{-9}$	$4.7.10^{-9}$	$2.8.10^{-9}$	$1.8.10^{-9}$	$1.4.10^{-9}$
Re-182m		1.0	$2.4.10^{-9}$	0.8	$1.7.10^{-9}$	$8.9.10^{-10}$	$5.2.10^{-10}$	$3.5.10^{-10}$	$2.7.10^{-10}$
Re-184		1.0	$8.9.10^{-9}$	0.8	$5.6.10^{-9}$	$3.0.10^{-9}$	$1.8.10^{-9}$	$1.3.10^{-9}$	$1.0.10^{-9}$
Re-184m		1.0	$1.7.10^{-8}$	0.8	$9.8.10^{-9}$	$4.9.10^{-9}$	$2.8.10^{-9}$	$1.9.10^{-9}$	$1.5.10^{-9}$
Re-186		1.0	$1.9.10^{-8}$	0.8	$1.1.10^{-8}$	$5.5.10^{-9}$	$3.0.10^{-9}$	$1.9.10^{-9}$	$1.5.10^{-9}$
Re-186m		1.0	$3.0.10^{-8}$	0.8	$1.6.10^{-8}$	$7.6.10^{-9}$	$4.4.10^{-9}$	$2.8.10^{-9}$	$2.2.10^{-9}$
Re-187		1.0	$6.8.10^{-11}$	0.8	$3.8.10^{-11}$	$1.8.10^{-11}$	$1.0.10^{-11}$	$6.6.10^{-12}$	$5.1.10^{-12}$
Re-188		1.0	$1.7.10^{-8}$	0.8	$1.1.10^{-8}$	$5.4.10^{-9}$	$2.9.10^{-9}$	$1.8.10^{-9}$	$1.4.10^{-9}$
Re-188m		1.0	$3.8.10^{-10}$	0.8	$2.3.10^{-10}$	$1.1.10^{-10}$	$6.1.10^{-11}$	$4.0.10^{-11}$	$3.0.10^{-11}$
Re-189		1.0	$9.8.10^{-9}$	0.8	$6.2.10^{-9}$	$3.0.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$7.8.10^{-10}$
osmium									
Os-180		0.02	$1.6.10^{-10}$	0.01	$9.8.10^{-11}$	$5.1.10^{-11}$	$3.2.10^{-11}$	$2.2.10^{-11}$	$1.7.10^{-11}$
Os-181		0.02	$7.6.10^{-10}$	0.01	$5.0.10^{-10}$	$2.7.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$8.9.10^{-11}$
Os-182		0.02	$4.6.10^{-9}$	0.01	$3.2.10^{-9}$	$1.7.10^{-9}$	$1.1.10^{-9}$	$7.0.10^{-10}$	$5.6.10^{-10}$
Os-185		0.02	$3.8.10^{-9}$	0.01	$2.6.10^{-9}$	$1.5.10^{-9}$	$9.8.10^{-10}$	$6.5.10^{-10}$	$5.1.10^{-10}$
Os-189m		0.02	$2.1.10^{-10}$	0.01	$1.3.10^{-10}$	$6.5.10^{-11}$	$3.8.10^{-11}$	$2.2.10^{-11}$	$1.8.10^{-11}$
Os-191		0.02	$6.3.10^{-9}$	0.01	$4.1.10^{-9}$	$2.1.10^{-9}$	$1.2.10^{-9}$	$7.0.10^{-10}$	$5.7.10^{-10}$
Os-191m		0.02	$1.1.10^{-9}$	0.01	$7.1.10^{-10}$	$3.5.10^{-10}$	$2.1.10^{-10}$	$1.2.10^{-10}$	$9.6.10^{-11}$
Os-193		0.02	$9.3.10^{-9}$	0.01	$6.0.10^{-9}$	$3.0.10^{-9}$	$1.8.10^{-9}$	$1.0.10^{-9}$	$8.1.10^{-10}$
Os-194		0.02	$2.9.10^{-8}$	0.01	$1.7.10^{-8}$	$8.8.10^{-9}$	$5.2.10^{-9}$	$3.0.10^{-9}$	$2.4.10^{-9}$
iridium									
Ir-182		0.02	$5.3.10^{-10}$	0.01	$3.0.10^{-10}$	$1.5.10^{-10}$	$8.9.10^{-11}$	$6.0.10^{-11}$	$4.8.10^{-11}$
Ir-184		0.02	$1.5.10^{-9}$	0.01	$9.7.10^{-10}$	$5.2.10^{-10}$	$3.3.10^{-10}$	$2.1.10^{-10}$	$1.7.10^{-10}$

Element		f_1	h_{ing}[Sv/Bq]	f_1	h_{ing} [Sv/Bq]				
Nuclide		age < 1 year		≥ 1 year	1 year	5 years	10 years	15 years	adult
Ir-185		0.02	$2.4.10^{-9}$	0.01	$1.6.10^{-9}$	$8.6.10^{-10}$	$5.3.10^{-10}$	$3.3.10^{-10}$	$2.6.10^{-10}$
Ir-186		0.02	$3.8.10^{-9}$	0.01	$2.7.10^{-9}$	$1.5.10^{-9}$	$9.6.10^{-10}$	$6.1.10^{-10}$	$4.9.10^{-10}$
Ir-186m		0.02	$5.8.10^{-10}$	0.01	$3.6.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$7.7.10^{-11}$	$6.1.10^{-11}$
Ir-187		0.02	$1.1.10^{-9}$	0.01	$7.3.10^{-10}$	$3.9.10^{-10}$	$2.5.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
Ir-188		0.02	$4.6.10^{-9}$	0.01	$3.3.10^{-9}$	$1.8.10^{-9}$	$1.2.10^{-9}$	$7.9.10^{-10}$	$6.3.10^{-10}$
Ir-189		0.02	$2.5.10^{-9}$	0.01	$1.7.10^{-9}$	$8.6.10^{-10}$	$5.2.10^{-10}$	$3.0.10^{-10}$	$2.4.10^{-10}$
Ir-190		0.02	$1.0.10^{-8}$	0.01	$7.1.10^{-9}$	$3.9.10^{-9}$	$2.5.10^{-9}$	$1.6.10^{-9}$	$1.2.10^{-9}$
Ir-190m'		0.02	$9.4.10^{-10}$	0.01	$6.4.10^{-10}$	$3.5.10^{-10}$	$2.3.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
Ir-190m		0.02	$7.9.10^{-11}$	0.01	$5.0.10^{-11}$	$2.6.10^{-11}$	$1.6.10^{-11}$	$1.0.10^{-11}$	$8.0.10^{-12}$
Ir-192		0.02	$1.3.10^{-8}$	0.01	$8.7.10^{-9}$	$4.6.10^{-9}$	$2.8.10^{-9}$	$1.7.10^{-9}$	$1.4.10^{-9}$
Ir-192m		0.02	$2.8.10^{-9}$	0.01	$1.4.10^{-9}$	$8.3.10^{-10}$	$5.5.10^{-10}$	$3.7.10^{-10}$	$3.1.10^{-10}$
Ir-193m		0.02	$3.2.10^{-9}$	0.01	$2.0.10^{-9}$	$1.0.10^{-9}$	$6.0.10^{-10}$	$3.4.10^{-10}$	$2.7.10^{-10}$
Ir-194		0.02	$1.5.10^{-8}$	0.01	$9.8.10^{-9}$	$4.9.10^{-9}$	$2.9.10^{-9}$	$1.7.10^{-9}$	$1.3.10^{-9}$
Ir-194m		0.02	$1.7.10^{-8}$	0.01	$1.1.10^{-8}$	$6.4.10^{-9}$	$4.1.10^{-9}$	$2.6.10^{-9}$	$2.1.10^{-9}$
Ir-195		0.02	$1.2.10^{-9}$	0.01	$7.3.10^{-10}$	$3.6.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$1.0.10^{-10}$
Ir-195m		0.02	$2.3.10^{-9}$	0.01	$1.5.10^{-9}$	$7.3.10^{-10}$	$4.3.10^{-10}$	$2.6.10^{-10}$	$2.1.10^{-10}$
platinum									
Pt-186		0.02	$7.8.10^{-10}$	0.01	$5.3.10^{-10}$	$2.9.10^{-10}$	$1.8.10^{-10}$	$1.2.10^{-10}$	$9.3.10^{-11}$
Pt-188		0.02	$6.7.10^{-9}$	0.01	$4.5.10^{-9}$	$2.4.10^{-9}$	$1.5.10^{-9}$	$9.5.10^{-10}$	$7.6.10^{-10}$
Pt-189		0.02	$1.1.10^{-9}$	0.01	$7.4.10^{-10}$	$3.9.10^{-10}$	$2.5.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
Pt-191		0.02	$3.1.10^{-9}$	0.01	$2.1.10^{-9}$	$1.1.10^{-9}$	$6.9.10^{-10}$	$4.2.10^{-10}$	$3.4.10^{-10}$
Pt-193		0.02	$3.7.10^{-10}$	0.01	$2.4.10^{-10}$	$1.2.10^{-10}$	$6.9.10^{-11}$	$3.9.10^{-11}$	$3.1.10^{-11}$
Pt-193m		0.02	$5.2.10^{-9}$	0.01	$3.4.10^{-9}$	$1.7.10^{-9}$	$9.9.10^{-10}$	$5.6.10^{-10}$	$4.5.10^{-10}$
Pt-195m		0.02	$7.1.10^{-9}$	0.01	$4.6.10^{-9}$	$2.3.10^{-9}$	$1.4.10^{-9}$	$7.9.10^{-10}$	$6.3.10^{-10}$
Pt-197		0.02	$4.7.10^{-9}$	0.01	$3.0.10^{-9}$	$1.5.10^{-9}$	$8.8.10^{-10}$	$5.1.10^{-10}$	$4.0.10^{-10}$
Pt-197m		0.02	$1.0.10^{-9}$	0.01	$6.1.10^{-10}$	$3.0.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$8.4.10^{-11}$
Pt-199		0.02	$4.7.10^{-10}$	0.01	$2.7.10^{-10}$	$1.3.10^{-10}$	$7.5.10^{-11}$	$5.0.10^{-11}$	$3.9.10^{-11}$
Pt-200		0.02	$1.4.10^{-8}$	0.01	$8.8.10^{-9}$	$4.4.10^{-9}$	$2.6.10^{-9}$	$1.5.10^{-9}$	$1.2.10^{-9}$
gold									
Au-193		0.2	$1.2.10^{-9}$	0.1	$8.8.10^{-10}$	$4.6.10^{-10}$	$2.8.10^{-10}$	$1.7.10^{-10}$	$1.3.10^{-10}$
Au-194		0.2	$2.9.10^{-9}$	0.1	$2.2.10^{-9}$	$1.2.10^{-9}$	$8.1.10^{-10}$	$5.3.10^{-10}$	$4.2.10^{-10}$
Au-195		0.2	$2.4.10^{-9}$	0.1	$1.7.10^{-9}$	$8.9.10^{-10}$	$5.4.10^{-10}$	$3.2.10^{-10}$	$2.5.10^{-10}$
Au-198		0.2	$1.0.10^{-8}$	0.1	$7.2.10^{-9}$	$3.7.10^{-9}$	$2.2.10^{-9}$	$1.3.10^{-9}$	$1.0.10^{-9}$
Au-198m		0.2	$1.2.10^{-8}$	0.1	$8.5.10^{-9}$	$4.4.10^{-9}$	$2.7.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
Au-199		0.2	$4.5.10^{-9}$	0.1	$3.1.10^{-9}$	$1.6.10^{-9}$	$9.5.10^{-10}$	$5.5.10^{-10}$	$4.4.10^{-10}$
Au-200		0.2	$8.3.10^{-10}$	0.1	$4.7.10^{-10}$	$2.3.10^{-10}$	$1.3.10^{-10}$	$8.7.10^{-11}$	$6.8.10^{-11}$

Element		f_1	h_{ing}[Sv/Bq]	f_1	h_{ing} [Sv/Bq]				
Nuclide		age < 1 year		≥ 1 year	1 year	5 years	10 years	15 years	adult
Au-200m		0.2	$9.2.10^{-9}$	0.1	$6.6.10^{-9}$	$3.5.10^{-9}$	$2.2.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$
Au-201		0.2	$3.1.10^{-10}$	0.1	$1.7.10^{-10}$	$8.2.10^{-11}$	$4.6.10^{-11}$	$3.1.10^{-11}$	$2.4.10^{-11}$
mercury									
Hg-193	methyl mercury	1.0	$3.3.10^{-10}$	1.0	$1.9.10^{-10}$	$9.8.10^{-11}$	$5.8.10^{-11}$	$3.9.10^{-11}$	$3.1.10^{-11}$
	other org.	0.8	$4.7.10^{-10}$	0.4	$4.4.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$8.3.10^{-11}$	$6.6.10^{-11}$
	inorganic	0.04	$8.5.10^{-10}$	0.02	$5.5.10^{-10}$	$2.8.10^{-10}$	$1.7.10^{-10}$	$1.0.10^{-10}$	$8.2.10^{-11}$
Hg-193m	methyl mercury	1.0	$1.1.10^{-9}$	1.0	$6.8.10^{-10}$	$3.7.10^{-10}$	$2.3.10^{-10}$	$1.5.10^{-10}$	$1.3.10^{-10}$
	other org.	0.8	$1.6.10^{-9}$	0.4	$1.8.10^{-9}$	$9.5.10^{-10}$	$6.0.10^{-10}$	$3.7.10^{-10}$	$3.0.10^{-10}$
	inorganic	0.04	$3.6.10^{-9}$	0.02	$2.4.10^{-9}$	$1.3.10^{-9}$	$8.1.10^{-10}$	$5.0.10^{-10}$	$4.0.10^{-10}$
Hg-194	methyl mercury	1.0	$1.3.10^{-7}$	1.0	$1.2.10^{-7}$	$8.4.10^{-8}$	$6.6.10^{-8}$	$5.5.10^{-8}$	$5.1.10^{-8}$
	other org.	0.8	$1.1.10^{-7}$	0.4	$4.8.10^{-8}$	$3.5.10^{-8}$	$2.7.10^{-8}$	$2.3.10^{-8}$	$2.1.10^{-8}$
	inorganic	0.04	$7.2.10^{-9}$	0.02	$3.6.10^{-9}$	$2.6.10^{-9}$	$1.9.10^{-9}$	$1.5.10^{-9}$	$1.4.10^{-9}$
Hg-195	methyl mercury	1.0	$3.0.10^{-10}$	1.0	$2.0.10^{-10}$	$1.0.10^{-10}$	$6.4.10^{-11}$	$4.2.10^{-11}$	$3.4.10^{-11}$
	other org.	0.80	$4.6.10^{-10}$	0.4	$4.8.10^{-10}$	$2.5.10^{-10}$	$1.5.10^{-10}$	$9.3.10^{-11}$	$7.5.10^{-11}$
	inorganic	0.04	$9.5.10^{-10}$	0.02	$6.3.10^{-10}$	$3.3.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$9.7.10^{-11}$
Hg-195m	methyl mercury	1.0	$2.1.10^{-9}$	1.0	$1.3.10^{-9}$	$6.8.10^{-10}$	$4.2.10^{-10}$	$2.7.10^{-10}$	$2.2.10^{-10}$
	other org.	0.8	$2.6.10^{-9}$	0.4	$2.8.10^{-9}$	$1.4.10^{-9}$	$8.7.10^{-10}$	$5.1.10^{-10}$	$4.1.10^{-10}$
	inorganic	0.04	$5.8.10^{-9}$	0.02	$3.8.10^{-9}$	$2.0.10^{-9}$	$1.2.10^{-9}$	$7.0.10^{-10}$	$5.6.10^{-10}$
Hg-197	methyl mercury	1.0	$9.7.10^{-10}$	1.0	$6.2.10^{-10}$	$3.1.10^{-10}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$9.9.10^{-11}$
	other org.	0.8	$1.3.10^{-9}$	0.4	$1.2.10^{-9}$	$6.1.10^{-10}$	$3.7.10^{-10}$	$2.2.10^{-10}$	$1.7.10^{-10}$
	inorganic	0.04	$2.5.10^{-9}$	0.02	$1.6.10^{-9}$	$8.3.10^{-10}$	$5.0.10^{-10}$	$2.9.10^{-10}$	$2.3.10^{-10}$
Hg-197m	methyl mercury	1.0	$1.5.10^{-9}$	1.0	$9.5.10^{-10}$	$4.8.10^{-10}$	$2.9.10^{-10}$	$1.8.10^{-10}$	$1.5.10^{-10}$
	other org.	0.8	$2.2.10^{-9}$	0.4	$2.5.10^{-9}$	$1.2.10^{-9}$	$7.3.10^{-10}$	$4.2.10^{-10}$	$3.4.10^{-10}$
	inorganic	0.04	$5.2.10^{-9}$	0.02	$3.4.10^{-9}$	$1.7.10^{-9}$	$1.0.10^{-9}$	$5.9.10^{-10}$	$4.7.10^{-10}$
Hg-199m	methyl mercury	1.0	$3.4.10^{-10}$	1.0	$1.9.10^{-10}$	$9.3.10^{-11}$	$5.3.10^{-11}$	$3.6.10^{-11}$	$2.8.10^{-11}$
	other org.	0.8	$3.6.10^{-10}$	0.4	$2.1.10^{-10}$	$1.0.10^{-10}$	$5.8.10^{-11}$	$3.9.10^{-11}$	$3.1.10^{-11}$
	inorganic	0.04	$3.7.10^{-10}$	0.02	$2.1.10^{-10}$	$1.0.10^{-10}$	$5.9.10^{-11}$	$3.9.10^{-11}$	$3.1.10^{-11}$
Hg-203	methyl mercury	1.0	$1.5.10^{-8}$	1.0	$1.1.10^{-8}$	$5.7.10^{-9}$	$3.6.10^{-9}$	$2.3.10^{-9}$	$1.9.10^{-9}$
	other org.	0.8	$1.3.10^{-8}$	0.4	$6.4.10^{-9}$	$3.4.10^{-9}$	$2.1.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$
	inorganic	0.04	$5.5.10^{-9}$	0.02	$3.6.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$6.7.10^{-10}$	$5.4.10^{-10}$

Element		f_1	h_{ing}[Sv/Bq]	f_1	h_{ing} [Sv/Bq]				
Nuclide		age < 1 year		≥ 1 year	1 year	5 years	10 years	15 years	adult
thallium									
Tl-194		1.0	$6.1.10^{-11}$	1.0	$3.9.10^{-11}$	$2.2.10^{-11}$	$1.4.10^{-11}$	$1.0.10^{-11}$	$8.1.10^{-12}$
Tl-194m		1.0	$3.8.10^{-10}$	1.0	$2.2.10^{-10}$	$1.2.10^{-10}$	$7.0.10^{-11}$	$4.9.10^{-11}$	$4.0.10^{-11}$
Tl-195		1.0	$2.3.10^{-10}$	1.0	$1.4.10^{-10}$	$7.5.10^{-11}$	$4.7.10^{-11}$	$3.3.10^{-11}$	$2.7.10^{-11}$
Tl-197		1.0	$2.1.10^{-10}$	1.0	$1.3.10^{-10}$	$6.7.10^{-11}$	$4.2.10^{-11}$	$2.8.10^{-11}$	$2.3.10^{-11}$
Tl-198		1.0	$4.7.10^{-10}$	1.0	$3.3.10^{-10}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$8.7.10^{-11}$	$7.3.10^{-11}$
Tl-198m		1.0	$4.8.10^{-10}$	1.0	$3.0.10^{-10}$	$1.6.10^{-10}$	$9.7.10^{-11}$	$6.7.10^{-11}$	$5.4.10^{-11}$
Tl-199		1.0	$2.3.10^{-10}$	1.0	$1.5.10^{-10}$	$7.7.10^{-11}$	$4.8.10^{-11}$	$3.2.10^{-11}$	$2.6.10^{-11}$
Tl-200		1.0	$1.3.10^{-9}$	1.0	$9.1.10^{-10}$	$5.3.10^{-10}$	$3.5.10^{-10}$	$2.4.10^{-10}$	$2.0.10^{-10}$
Tl-201		1.0	$8.4.10^{-10}$	1.0	$5.5.10^{-10}$	$2.9.10^{-10}$	$1.8.10^{-10}$	$1.2.10^{-10}$	$9.5.10^{-11}$
Tl-202		1.0	$2.9.10^{-9}$	1.0	$2.1.10^{-9}$	$1.2.10^{-9}$	$7.9.10^{-10}$	$5.4.10^{-10}$	$4.5.10^{-10}$
Tl-204		1.0	$1.3.10^{-8}$	1.0	$8.5.10^{-9}$	$4.2.10^{-9}$	$2.5.10^{-9}$	$1.5.10^{-9}$	$1.2.10^{-9}$
lead									
Pb-195m		0.6	$2.6.10^{-10}$	0.2	$1.6.10^{-10}$	$8.4.10^{-11}$	$5.2.10^{-11}$	$3.5.10^{-11}$	$2.9.10^{-11}$
Pb-198		0.6	$5.9.10^{-10}$	0.2	$4.8.10^{-10}$	$2.7.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$1.0.10^{-10}$
Pb-199		0.6	$3.5.10^{-10}$	0.2	$2.6.10^{-10}$	$1.5.10^{-10}$	$9.4.10^{-11}$	$6.3.10^{-11}$	$5.4.10^{-11}$
Pb-200		0.6	$2.5.10^{-9}$	0.2	$2.0.10^{-9}$	$1.1.10^{-9}$	$7.0.10^{-10}$	$4.4.10^{-10}$	$4.0.10^{-10}$
Pb-201		0.6	$9.4.10^{-10}$	0.2	$7.8.10^{-10}$	$4.3.10^{-10}$	$2.7.10^{-10}$	$1.8.10^{-10}$	$1.6.10^{-10}$
Pb-202		0.6	$3.4.10^{-8}$	0.2	$1.6.10^{-8}$	$1.3.10^{-8}$	$1.9.10^{-8}$	$2.7.10^{-8}$	$8.8.10^{-9}$
Pb-202m		0.6	$7.6.10^{-10}$	0.2	$6.1.10^{-10}$	$3.5.10^{-10}$	$2.3.10^{-10}$	$1.5.10^{-10}$	$1.3.10^{-10}$
Pb-203		0.6	$1.6.10^{-9}$	0.2	$1.3.10^{-9}$	$6.8.10^{-10}$	$4.3.10^{-10}$	$2.7.10^{-10}$	$2.4.10^{-10}$
Pb-205		0.6	$2.1.10^{-9}$	0.2	$9.9.10^{-10}$	$6.2.10^{-10}$	$6.1.10^{-10}$	$6.5.10^{-10}$	$2.8.10^{-10}$
Pb-209		0.6	$5.7.10^{-10}$	0.2	$3.8.10^{-10}$	$1.9.10^{-10}$	$1.1.10^{-10}$	$6.6.10^{-11}$	$5.7.10^{-11}$
Pb-210		0.6	$8.4.10^{-6}$	0.2	$3.6.10^{-6}$	$2.2.10^{-6}$	$1.9.10^{-6}$	$1.9.10^{-6}$	$6.9.10^{-7}$
Pb-211		0.6	$3.1.10^{-9}$	0.2	$1.4.10^{-9}$	$7.1.10^{-10}$	$4.1.10^{-10}$	$2.7.10^{-10}$	$1.8.10^{-10}$
Pb-212		0.6	$1.5.10^{-7}$	0.2	$6.3.10^{-8}$	$3.3.10^{-8}$	$2.0.10^{-8}$	$1.3.10^{-8}$	$6.0.10^{-9}$
Pb-214		0.6	$2.7.10^{-9}$	0.2	$1.0.10^{-9}$	$5.2.10^{-10}$	$3.1.10^{-10}$	$2.0.10^{-10}$	$1.4.10^{-10}$
bismuth									
Bi-200		0.1	$4.2.10^{-10}$	0.05	$2.7.10^{-10}$	$1.5.10^{-10}$	$9.5.10^{-11}$	$6.4.10^{-11}$	$5.1.10^{-11}$
Bi-201		0.1	$1.0.10^{-9}$	0.05	$6.7.10^{-10}$	$3.6.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$1.2.10^{-10}$
Bi-202		0.1	$6.4.10^{-10}$	0.05	$4.4.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$8.9.10^{-11}$
Bi-203		0.1	$3.5.10^{-9}$	0.05	$2.5.10^{-9}$	$1.4.10^{-9}$	$9.3.10^{-10}$	$6.0.10^{-10}$	$4.8.10^{-10}$
Bi-205		0.1	$6.1.10^{-9}$	0.05	$4.5.10^{-9}$	$2.6.10^{-9}$	$1.7.10^{-9}$	$1.1.10^{-9}$	$9.0.10^{-10}$
Bi-206		0.1	$1.4.10^{-8}$	0.05	$1.0.10^{-8}$	$5.7.10^{-9}$	$3.7.10^{-9}$	$2.4.10^{-9}$	$1.9.10^{-9}$
Bi-207		0.1	$1.0.10^{-8}$	0.05	$7.1.10^{-9}$	$3.9.10^{-9}$	$2.5.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
Bi-210		0.1	$1.5.10^{-8}$	0.05	$9.7.10^{-9}$	$4.8.10^{-9}$	$2.9.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$

Element		f_1	h_{ing}[Sv/Bq]	f_1	h_{ing} [Sv/Bq]				
Nuclide		age < 1 year		≥ 1 year	1 year	5 years	10 years	15 years	adult
Bi-210m		0.1	$2.1.10^{-7}$	0.05	$9.1.10^{-8}$	$4.7.10^{-8}$	$3.0.10^{-8}$	$1.9.10^{-8}$	$1.5.10^{-8}$
Bi-212		0.1	$3.2.10^{-9}$	0.05	$1.8.10^{-9}$	$8.7.10^{-10}$	$5.0.10^{-10}$	$3.3.10^{-10}$	$2.6.10^{-10}$
Bi-213		0.1	$2.5.10^{-9}$	0.05	$1.4.10^{-9}$	$6.7.10^{-10}$	$3.9.10^{-10}$	$2.5.10^{-10}$	$2.0.10^{-10}$
Bi-214		0.1	$1.4.10^{-9}$	0.05	$7.4.10^{-10}$	$3.6.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
polonium									
Po-203		1.0	$2.9.10^{-10}$	0.5	$2.4.10^{-10}$	$1.3.10^{-10}$	$8.5.10^{-11}$	$5.8.10^{-11}$	$4.6.10^{-11}$
Po-205		1.0	$3.5.10^{-10}$	0.5	$2.8.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$7.2.10^{-11}$	$5.8.10^{-11}$
Po-207		1.0	$4.4.10^{-10}$	0.5	$5.7.10^{-10}$	$3.2.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
Po-210		1.0	$2.6.10^{-5}$	0.5	$8.8.10^{-6}$	$4.4.10^{-6}$	$2.6.10^{-6}$	$1.6.10^{-6}$	$1.2.10^{-6}$
astatine									
At-207		1.0	$2.5.10^{-9}$	1.0	$1.6.10^{-9}$	$8.0.10^{-10}$	$4.8.10^{-10}$	$2.9.10^{-10}$	$2.4.10^{-10}$
At-211		1.0	$1.2.10^{-7}$	1.0	$7.8.10^{-8}$	$3.8.10^{-8}$	$2.3.10^{-8}$	$1.3.10^{-8}$	$1.1.10^{-8}$
francium									
Fr-222		1.0	$6.2.10^{-9}$	1.0	$3.9.10^{-9}$	$2.0.10^{-9}$	$1.3.10^{-9}$	$8.5.10^{-10}$	$7.2.10^{-10}$
Fr-223		1.0	$2.6.10^{-8}$	1.0	$1.7.10^{-8}$	$8.3.10^{-9}$	$5.0.10^{-9}$	$2.9.10^{-9}$	$2.4.10^{-9}$
radium									
Ra-223		0.6	$5.3.10^{-6}$	0.3**	$1.1.10^{-6}$	$5.7.10^{-7}$	$4.5.10^{-7}$	$3.7.10^{-7}$	$1.0.10^{-7}$
Ra-224		0.6	$2.7.10^{-6}$	0.3**	$6.6.10^{-7}$	$3.5.10^{-7}$	$2.6.10^{-7}$	$2.0.10^{-7}$	$6.5.10^{-8}$
Ra-225		0.6	$7.1.10^{-6}$	0.3**	$1.2.10^{-6}$	$6.1.10^{-7}$	$5.0.10^{-7}$	$4.4.10^{-7}$	$9.9.10^{-8}$
Ra-226		0.6	$4.7.10^{-6}$	0.3**	$9.6.10^{-7}$	$6.2.10^{-7}$	$8.0.10^{-7}$	$1.5.10^{-6}$	$2.8.10^{-7}$
Ra-227		0.6	$1.1.10^{-9}$	0.3**	$4.3.10^{-10}$	$2.5.10^{-10}$	$1.7.10^{-10}$	$1.3.10^{-10}$	$8.1.10^{-11}$
Ra-228		0.6	$3.0.10^{-5}$	0.3**	$5.7.10^{-6}$	$3.4.10^{-6}$	$3.9.10^{-6}$	$5.3.10^{-6}$	$6.9.10^{-7}$
actinium									
Ac-224		0.005	$1.0.10^{-8}$	$5.0.10^{-4}$	$5.2.10^{-9}$	$2.6.10^{-9}$	$1.5.10^{-9}$	$8.8.10^{-10}$	$7.0.10^{-10}$
Ac-225		0.005	$4.6.10^{-7}$	$5.0.10^{-4}$	$1.8.10^{-7}$	$9.1.10^{-8}$	$5.4.10^{-8}$	$3.0.10^{-8}$	$2.4.10^{-8}$
Ac-226		0.005	$1.4.10^{-7}$	$5.0.10^{-4}$	$7.6.10^{-8}$	$3.8.10^{-8}$	$2.3.10^{-8}$	$1.3.10^{-8}$	$1.0.10^{-8}$
Ac-227		0.005	$3.3.10^{-5}$	$5.0.10^{-4}$	$3.1.10^{-6}$	$2.2.10^{-6}$	$1.5.10^{-6}$	$1.2.10^{-6}$	$1.1.10^{-6}$
Ac-228		0.005	$7.4.10^{-9}$	$5.0.10^{-4}$	$2.8.10^{-9}$	$1.4.10^{-9}$	$8.7.10^{-10}$	$5.3.10^{-10}$	$4.3.10^{-10}$
thorium									
Th-226		0.005	$4.4.10^{-9}$	$5.0.10^{-4}$	$2.4.10^{-9}$	$1.2.10^{-9}$	$6.7.10^{-10}$	$4.5.10^{-10}$	$3.5.10^{-10}$
Th-227		0.005	$3.0.10^{-7}$	$5.0.10^{-4}$	$7.0.10^{-8}$	$3.6.10^{-8}$	$2.3.10^{-8}$	$1.5.10^{-8}$	$8.8.10^{-9}$
Th-228		0.005	$3.7.10^{-6}$	$5.0.10^{-4}$	$3.7.10^{-7}$	$2.2.10^{-7}$	$1.4.10^{-7}$	$9.4.10^{-8}$	$7.2.10^{-8}$
Th-229		0.005	$1.1.10^{-5}$	$5.0.10^{-4}$	$1.0.10^{-6}$	$7.8.10^{-7}$	$6.2.10^{-7}$	$5.3.10^{-7}$	$4.9.10^{-7}$
Th-230		0.005	$4.1.10^{-6}$	$5.0.10^{-4}$	$4.1.10^{-7}$	$3.1.10^{-7}$	$2.4.10^{-7}$	$2.2.10^{-7}$	$2.1.10^{-7}$
Th-231		0.005	$3.9.10^{-9}$	$5.0.10^{-4}$	$2.5.10^{-9}$	$1.2.10^{-9}$	$7.4.10^{-10}$	$4.2.10^{-10}$	$3.4.10^{-10}$
Th-232		0.005	$4.6.10^{-6}$	$5.0.10^{-4}$	$4.5.10^{-7}$	$3.5.10^{-7}$	$2.9.10^{-7}$	$2.5.10^{-7}$	$2.3.10^{-7}$

Element		f_1	h_{ing}[Sv/Bq]	f_1	h_{ing} [Sv/Bq]				
Nuclide		age < 1 year		≥ 1 year	1 year	5 years	10 years	15 years	adult
Th-234		0.005	$4.0.10^{-8}$	$5.0.10^{-4}$	$2.5.10^{-8}$	$1.3.10^{-8}$	$7.4.10^{-9}$	$4.2.10^{-9}$	$3.4.10^{-9}$
protactinium									
Pa-227		0.005	$5.8.10^{-9}$	$5.0.10^{-4}$	$3.2.10^{-9}$	$1.5.10^{-9}$	$8.7.10^{-10}$	$5.8.10^{-10}$	$4.5.10^{-10}$
Pa-228		0.005	$1.2.10^{-8}$	$5.0.10^{-4}$	$4.8.10^{-9}$	$2.6.10^{-9}$	$1.6.10^{-9}$	$9.7.10^{-10}$	$7.8.10^{-10}$
Pa-230		0.005	$2.6.10^{-8}$	$5.0.10^{-4}$	$5.7.10^{-9}$	$3.1.10^{-9}$	$1.9.10^{-9}$	$1.1.10^{-9}$	$9.2.10^{-10}$
Pa-231		0.005	$1.3.10^{-5}$	$5.0.10^{-4}$	$1.3.10^{-6}$	$1.1.10^{-6}$	$9.2.10^{-7}$	$8.0.10^{-7}$	$7.1.10^{-7}$
Pa-232		0.005	$7.2.10^{-9}$	$5.0.10^{-4}$	$4.3.10^{-9}$	$2.3.10^{-9}$	$1.4.10^{-9}$	$8.9.10^{-10}$	$7.2.10^{-10}$
Pa-233		0.005	$9.7.10^{-9}$	$5.0.10^{-4}$	$6.2.10^{-9}$	$3.2.10^{-9}$	$1.9.10^{-9}$	$1.1.10^{-9}$	$8.7.10^{-10}$
Pa-234		0.005	$5.0.10^{-9}$	$5.0.10^{-4}$	$3.2.10^{-9}$	$1.7.10^{-9}$	$1.0.10^{-9}$	$6.4.10^{-10}$	$5.1.10^{-10}$
uranium									
U-230		0.04	$7.9.10^{-7}$	0.02	$3.0.10^{-7}$	$1.5.10^{-7}$	$1.0.10^{-7}$	$6.6.10^{-8}$	$5.6.10^{-8}$
U-231		0.04	$3.1.10^{-9}$	0.02	$2.0.10^{-9}$	$1.0.10^{-9}$	$6.1.10^{-10}$	$3.6.10^{-10}$	$2.8.10^{-10}$
U-232		0.04	$2.5.10^{-6}$	0.02	$8.2.10^{-7}$	$5.8.10^{-7}$	$5.7.10^{-7}$	$6.4.10^{-7}$	$3.3.10^{-7}$
U-233		0.04	$3.8.10^{-7}$	0.02	$1.4.10^{-7}$	$9.2.10^{-8}$	$7.8.10^{-8}$	$7.8.10^{-8}$	$5.1.10^{-8}$
U-234		0.04	$3.7.10^{-7}$	0.02	$1.3.10^{-7}$	$8.8.10^{-8}$	$7.4.10^{-8}$	$7.4.10^{-8}$	$4.9.10^{-8}$
U-235		0.04	$3.5.10^{-7}$	0.02	$1.3.10^{-7}$	$8.5.10^{-8}$	$7.1.10^{-8}$	$7.0.10^{-8}$	$4.7.10^{-8}$
U-236		0.04	$3.5.10^{-7}$	0.02	$1.3.10^{-7}$	$8.4.10^{-8}$	$7.0.10^{-8}$	$7.0.10^{-8}$	$4.7.10^{-8}$
U-237		0.04	$8.3.10^{-9}$	0.02	$5.4.10^{-9}$	$2.8.10^{-9}$	$1.6.10^{-9}$	$9.5.10^{-10}$	$7.6.10^{-10}$
U-238		0.04	$3.4.10^{-7}$	0.02	$1.2.10^{-7}$	$8.0.10^{-8}$	$6.8.10^{-8}$	$6.7.10^{-8}$	$4.5.10^{-8}$
U-239		0.04	$3.4.10^{-10}$	0.02	$1.9.10^{-10}$	$9.3.10^{-11}$	$5.4.10^{-11}$	$3.5.10^{-11}$	$2.7.10^{-11}$
U-240		0.04	$1.3.10^{-8}$	0.02	$8.1.10^{-9}$	$4.1.10^{-9}$	$2.4.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
neptunium									
Np-232		0.005	$8.7.10^{-11}$	$5.0.10^{-4}$	$5.1.10^{-11}$	$2.7.10^{-11}$	$1.7.10^{-11}$	$1.2.10^{-11}$	$9.7.10^{-12}$
Np-233		0.005	$2.1.10^{-11}$	$5.0.10^{-4}$	$1.3.10^{-11}$	$6.6.10^{-12}$	$4.0.10^{-12}$	$2.8.10^{-12}$	$2.2.10^{-12}$
Np-234		0.005	$6.2.10^{-9}$	$5.0.10^{-4}$	$4.4.10^{-9}$	$2.4.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$8.1.10^{-10}$
Np-235		0.005	$7.1.10^{-10}$	$5.0.10^{-4}$	$4.1.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$6.8.10^{-11}$	$5.3.10^{-11}$
Np-236		0.005	$1.9.10^{-7}$	$5.0.10^{-4}$	$2.4.10^{-8}$	$1.8.10^{-8}$	$1.8.10^{-8}$	$1.8.10^{-8}$	$1.7.10^{-8}$
Np-236m		0.005	$2.5.10^{-9}$	$5.0.10^{-4}$	$1.3.10^{-9}$	$6.6.10^{-10}$	$4.0.10^{-10}$	$2.4.10^{-10}$	$1.9.10^{-10}$
Np-237		0.005	$2.0.10^{-6}$	$5.0.10^{-4}$	$2.1.10^{-7}$	$1.4.10^{-7}$	$1.1.10^{-7}$	$1.1.10^{-7}$	$1.1.10^{-7}$
Np-238		0.005	$9.5.10^{-9}$	$5.0.10^{-4}$	$6.2.10^{-9}$	$3.2.10^{-9}$	$1.9.10^{-9}$	$1.1.10^{-9}$	$9.1.10^{-10}$
Np-239		0.005	$8.9.10^{-9}$	$5.0.10^{-4}$	$5.7.10^{-9}$	$2.9.10^{-9}$	$1.7.10^{-9}$	$1.0.10^{-9}$	$8.0.10^{-10}$
Np-240		0.005	$8.7.10^{-10}$	$5.0.10^{-4}$	$5.2.10^{-10}$	$2.6.10^{-10}$	$1.6.10^{-10}$	$1.0.10^{-10}$	$8.2.10^{-11}$
plutonium									
Pu-234		0.005	$2.1.10^{-9}$	$5.0.10^{-4}$	$1.1.10^{-9}$	$5.5.10^{-10}$	$3.3.10^{-10}$	$2.0.10^{-10}$	$1.6.10^{-10}$
Pu-235		0.005	$2.2.10^{-11}$	$5.0.10^{-4}$	$1.3.10^{-11}$	$6.5.10^{-12}$	$3.9.10^{-12}$	$2.7.10^{-12}$	$2.1.10^{-12}$
Pu-236		0.005	$2.1.10^{-6}$	$5.0.10^{-4}$	$2.2.10^{-7}$	$1.4.10^{-7}$	$1.0.10^{-7}$	$8.5.10^{-8}$	$8.7.10^{-8}$

Element		**f_1**	**h_{ing}[Sv/Bq]**	**f_1**	**h_{ing} [Sv/Bq]**				
Nuclide		**age < 1 year**		**≥ 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Pu-237		0.005	$1.1.10^{-9}$	$5.0.10^{-4}$	$6.9.10^{-10}$	$3.6.10^{-10}$	$2.2.10^{-10}$	$1.3.10^{-10}$	$1.0.10^{-10}$
Pu-238		0.005	$4.0.10^{-6}$	$5.0.10^{-4}$	$4.0.10^{-7}$	$3.1.10^{-7}$	$2.4.10^{-7}$	$2.2.10^{-7}$	$2.3.10^{-7}$
Pu-239		0.005	$4.2.10^{-6}$	$5.0.10^{-4}$	$4.2.10^{-7}$	$3.3.10^{-7}$	$2.7.10^{-7}$	$2.4.10^{-7}$	$2.5.10^{-7}$
Pu-240		0.005	$4.2.10^{-6}$	$5.0.10^{-4}$	$4.2.10^{-7}$	$3.3.10^{-7}$	$2.7.10^{-7}$	$2.4.10^{-7}$	$2.5.10^{-7}$
Pu-241		0.005	$5.6.10^{-8}$	$5.0.10^{-4}$	$5.7.10^{-9}$	$5.5.10^{-9}$	$5.1.10^{-9}$	$4.8.10^{-9}$	$4.8.10^{-9}$
Pu-242		0.005	$4.0.10^{-6}$	$5.0.10^{-4}$	$4.0.10^{-7}$	$3.2.10^{-7}$	$2.6.10^{-7}$	$2.3.10^{-7}$	$2.4.10^{-7}$
Pu-243		0.005	$1.0.10^{-9}$	$5.0.10^{-4}$	$6.2.10^{-10}$	$3.1.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$8.5.10^{-11}$
Pu-244		0.005	$4.0.10^{-6}$	$5.0.10^{-4}$	$4.1.10^{-7}$	$3.2.10^{-7}$	$2.6.10^{-7}$	$2.3.10^{-7}$	$2.4.10^{-7}$
Pu-245		0.005	$8.0.10^{-9}$	$5.0.10^{-4}$	$5.1.10^{-9}$	$2.6.10^{-9}$	$1.5.10^{-9}$	$8.9.10^{-10}$	$7.2.10^{-10}$
Pu-246		0.005	$3.6.10^{-8}$	$5.0.10^{-4}$	$2.3.10^{-8}$	$1.2.10^{-8}$	$7.1.10^{-9}$	$4.1.10^{-9}$	$3.3.10^{-9}$
americium									
Am-237		0.005	$1.7.10^{-10}$	$5.0.10^{-4}$	$1.0.10^{-10}$	$5.5.10^{-11}$	$3.3.10^{-11}$	$2.2.10^{-11}$	$1.8.10^{-11}$
Am-238		0.005	$2.5.10^{-10}$	$5.0.10^{-4}$	$1.6.10^{-10}$	$9.1.10^{-11}$	$5.9.10^{-11}$	$4.0.10^{-11}$	$3.2.10^{-11}$
Am-239		0.005	$2.6.10^{-9}$	$5.0.10^{-4}$	$1.7.10^{-9}$	$8.4.10^{-10}$	$5.1.10^{-10}$	$3.0.10^{-10}$	$2.4.10^{-10}$
Am-240		0.005	$4.7.10^{-9}$	$5.0.10^{-4}$	$3.3.10^{-9}$	$1.8.10^{-9}$	$1.2.10^{-9}$	$7.3.10^{-10}$	$5.8.10^{-10}$
Am-241		0.005	$3.7.10^{-6}$	$5.0.10^{-4}$	$3.7.10^{-7}$	$2.7.10^{-7}$	$2.2.10^{-7}$	$2.0.10^{-7}$	$2.0.10^{-7}$
Am-242		0.005	$5.0.10^{-9}$	$5.0.10^{-4}$	$2.2.10^{-9}$	$1.1.10^{-9}$	$6.4.10^{-10}$	$3.7.10^{-10}$	$3.0.10^{-10}$
Am-242m		0.005	$3.1.10^{-6}$	$5.0.10^{-4}$	$3.0.10^{-7}$	$2.3.10^{-7}$	$2.0.10^{-7}$	$1.9.10^{-7}$	$1.9.10^{-7}$
Am-243		0.005	$3.6.10^{-6}$	$5.0.10^{-4}$	$3.7.10^{-7}$	$2.7.10^{-7}$	$2.2.10^{-7}$	$2.0.10^{-7}$	$2.0.10^{-7}$
Am-244		0.005	$4.9.10^{-9}$	$5.0.10^{-4}$	$3.1.10^{-9}$	$1.6.10^{-9}$	$9.6.10^{-10}$	$5.8.10^{-10}$	$4.6.10^{-10}$
Am-244m		0.005	$3.7.10^{-10}$	$5.0.10^{-4}$	$2.0.10^{-10}$	$9.6.10^{-11}$	$5.5.10^{-11}$	$3.7.10^{-11}$	$2.9.10^{-11}$
Am-245		0.005	$6.8.10^{-10}$	$5.0.10^{-4}$	$4.5.10^{-10}$	$2.2.10^{-10}$	$1.3.10^{-10}$	$7.9.10^{-11}$	$6.2.10^{-11}$
Am-246		0.005	$6.7.10^{-10}$	$5.0.10^{-4}$	$3.8.10^{-10}$	$1.9.10^{-10}$	$1.1.10^{-10}$	$7.3.10^{-11}$	$5.8.10^{-11}$
Am-246m		0.005	$3.9.10^{-10}$	$5.0.10^{-4}$	$2.2.10^{-10}$	$1.1.10^{-10}$	$6.4.10^{-11}$	$4.4.10^{-11}$	$3.4.10^{-11}$
curium									
Cm-238		0.005	$7.8.10^{-10}$	$5.0.10^{-4}$	$4.9.10^{-10}$	$2.6.10^{-10}$	$1.6.10^{-10}$	$1.0.10^{-10}$	$8.0.10^{-11}$
Cm-240		0.005	$2.2.10^{-7}$	$5.0.10^{-4}$	$4.8.10^{-8}$	$2.5.10^{-8}$	$1.5.10^{-8}$	$9.2.10^{-9}$	$7.6.10^{-9}$
Cm-241		0.005	$1.1.10^{-8}$	$5.0.10^{-4}$	$5.7.10^{-9}$	$3.0.10^{-9}$	$1.9.10^{-9}$	$1.1.10^{-9}$	$9.1.10^{-10}$
Cm-242		0.005	$5.9.10^{-7}$	$5.0.10^{-4}$	$7.6.10^{-8}$	$3.9.10^{-8}$	$2.4.10^{-8}$	$1.5.10^{-8}$	$1.2.10^{-8}$
Cm-243		0.005	$3.2.10^{-6}$	$5.0.10^{-4}$	$3.3.10^{-7}$	$2.2.10^{-7}$	$1.6.10^{-7}$	$1.4.10^{-7}$	$1.5.10^{-7}$
Cm-244		0.005	$2.9.10^{-6}$	$5.0.10^{-4}$	$2.9.10^{-7}$	$1.9.10^{-7}$	$1.4.10^{-7}$	$1.2.10^{-7}$	$1.2.10^{-7}$
Cm-245		0.005	$3.7.10^{-6}$	$5.0.10^{-4}$	$3.7.10^{-7}$	$2.8.10^{-7}$	$2.3.10^{-7}$	$2.1.10^{-7}$	$2.1.10^{-7}$
Cm-246		0.005	$3.7.10^{-6}$	$5.0.10^{-4}$	$3.7.10^{-7}$	$2.8.10^{-7}$	$2.2.10^{-7}$	$2.1.10^{-7}$	$2.1.10^{-7}$
Cm-247		0.005	$3.4.10^{-6}$	$5.0.10^{-4}$	$3.5.10^{-7}$	$2.6.10^{-7}$	$2.1.10^{-7}$	$1.9.10^{-7}$	$1.9.10^{-7}$
Cm-248		0.005	$1.4.10^{-5}$	$5.0.10^{-4}$	$1.4.10^{-6}$	$1.0.10^{-6}$	$8.4.10^{-7}$	$7.7.10^{-7}$	$7.7.10^{-7}$
Cm-249		0.005	$3.9.10^{-10}$	$5.0.10^{-4}$	$2.2.10^{-10}$	$1.1.10^{-10}$	$6.1.10^{-11}$	$4.0.10^{-11}$	$3.1.10^{-11}$

Element		f_1	h_{ing}[Sv/Bq]	f_1	h_{ing} [Sv/Bq]				
Nuclide		age < 1 year		≥ 1 year	1 year	5 years	10 years	15 years	adult
Cm-250		0.005	$7.8.10^{-5}$	$5.0.10^{-4}$	$8.2.10^{-6}$	$6.0.10^{-6}$	$4.9.10^{-6}$	$4.4.10^{-6}$	$4.4.10^{-6}$
berkelium									
Bk-245		0.005	$6.1.10^{-9}$	$5.0.10^{-4}$	$3.9.10^{-9}$	$2.0.10^{-9}$	$1.2.10^{-9}$	$7.2.10^{-10}$	$5.7.10^{-10}$
Bk-246		0.005	$3.7.10^{-9}$	$5.0.10^{-4}$	$2.6.10^{-9}$	$1.4.10^{-9}$	$9.4.10^{-10}$	$6.0.10^{-10}$	$4.8.10^{-10}$
Bk-247		0.005	$8.9.10^{-6}$	$5.0.10^{-4}$	$8.6.10^{-7}$	$6.3.10^{-7}$	$4.6.10^{-7}$	$3.8.10^{-7}$	$3.5.10^{-7}$
Bk-249		0.005	$2.2.10^{-8}$	$5.0.10^{-4}$	$2.9.10^{-9}$	$1.9.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$	$9.7.10^{-10}$
Bk-250		0.005	$1.5.10^{-9}$	$5.0.10^{-4}$	$8.5.10^{-10}$	$4.4.10^{-10}$	$2.7.10^{-10}$	$1.7.10^{-10}$	$1.4.10^{-10}$
californium									
Cf-244		0.005	$9.8.10^{-10}$	$5.0.10^{-4}$	$4.8.10^{-10}$	$2.4.10^{-10}$	$1.3.10^{-10}$	$8.9.10^{-11}$	$7.0.10^{-11}$
Cf-246		0.005	$5.0.10^{-8}$	$5.0.10^{-4}$	$2.4.10^{-8}$	$1.2.10^{-8}$	$7.3.10^{-9}$	$4.1.10^{-9}$	$3.3.10^{-9}$
Cf-248		0.005	$1.5.10^{-6}$	$5.0.10^{-4}$	$1.6.10^{-7}$	$9.9.10^{-8}$	$6.0.10^{-8}$	$3.3.10^{-8}$	$2.8.10^{-8}$
Cf-249		0.005	$9.0.10^{-6}$	$5.0.10^{-4}$	$8.7.10^{-7}$	$6.4.10^{-7}$	$4.7.10^{-7}$	$3.8.10^{-7}$	$3.5.10^{-7}$
Cf-250		0.005	$5.7.10^{-6}$	$5.0.10^{-4}$	$5.5.10^{-7}$	$3.7.10^{-7}$	$2.3.10^{-7}$	$1.7.10^{-7}$	$1.6.10^{-7}$
Cf-251		0.005	$9.1.10^{-6}$	$5.0.10^{-4}$	$8.8.10^{-7}$	$6.5.10^{-7}$	$4.7.10^{-7}$	$3.9.10^{-7}$	$3.6.10^{-7}$
Cf-252		0.005	$5.0.10^{-6}$	$5.0.10^{-4}$	$5.1.10^{-7}$	$3.2.10^{-7}$	$1.9.10^{-7}$	$1.0.10^{-7}$	$9.0.10^{-8}$
Cf-253		0.005	$1.0.10^{-7}$	$5.0.10^{-4}$	$1.1.10^{-8}$	$6.0.10^{-9}$	$3.7.10^{-9}$	$1.8.10^{-9}$	$1.4.10^{-9}$
Cf-254		0.005	$1.1.10^{-5}$	$5.0.10^{-4}$	$2.6.10^{-6}$	$1.4.10^{-6}$	$8.4.10^{-7}$	$5.0.10^{-7}$	$4.0.10^{-7}$
einsteinium									
Es-250		0.005	$2.3.10^{-10}$	$5.0.10^{-4}$	$9.9.10^{-11}$	$5.7.10^{-11}$	$3.7.10^{-11}$	$2.6.10^{-11}$	$2.1.10^{-11}$
Es-251		0.005	$1.9.10^{-9}$	$5.0.10^{-4}$	$1.2.10^{-9}$	$6.1.10^{-10}$	$3.7.10^{-10}$	$2.2.10^{-10}$	$1.7.10^{-10}$
Es-253		0.005	$1.7.10^{-7}$	$5.0.10^{-4}$	$4.5.10^{-8}$	$2.3.10^{-8}$	$1.4.10^{-8}$	$7.6.10^{-9}$	$6.1.10^{-9}$
Es-254		0.005	$1.4.10^{-6}$	$5.0.10^{-4}$	$1.6.10^{-7}$	$9.8.10^{-8}$	$6.0.10^{-8}$	$3.3.10^{-8}$	$2.8.10^{-8}$
Es-254m		0.005	$5.7.10^{-8}$	$5.0.10^{-4}$	$3.0.10^{-8}$	$1.5.10^{-8}$	$9.1.10^{-9}$	$5.2.10^{-9}$	$4.2.10^{-9}$
fermium									
Fm-252		0.005	$3.8.10^{-8}$	$5.0.10^{-4}$	$2.0.10^{-8}$	$9.9.10^{-9}$	$5.9.10^{-9}$	$3.3.10^{-9}$	$2.7.10^{-9}$
Fm-253		0.005	$2.5.10^{-8}$	$5.0.10^{-4}$	$6.7.10^{-9}$	$3.4.10^{-9}$	$2.1.10^{-9}$	$1.1.10^{-9}$	$9.1.10^{-10}$
Fm-254		0.005	$5.6.10^{-9}$	$5.0.10^{-4}$	$3.2.10^{-9}$	$1.6.10^{-9}$	$9.3.10^{-10}$	$5.6.10^{-10}$	$4.4.10^{-10}$
Fm-255		0.005	$3.3.10^{-8}$	$5.0.10^{-4}$	$1.9.10^{-8}$	$9.5.10^{-9}$	$5.6.10^{-9}$	$3.2.10^{-9}$	$2.5.10^{-9}$
Fm-257		0.005	$9.8.10^{-7}$	$5.0.10^{-4}$	$1.1.10^{-7}$	$6.5.10^{-8}$	$4.0.10^{-8}$	$1.9.10^{-8}$	$1.5.10^{-8}$
mendelevium									
Md-257		0.005	$3.1.10^{-9}$	$5.0.10^{-4}$	$8.8.10^{-10}$	$4.5.10^{-10}$	$2.7.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
Md-258		0.005	$6.3.10^{-7}$	$5.0.10^{-4}$	$8.9.10^{-8}$	$5.0.10^{-8}$	$3.0.10^{-8}$	$1.6.10^{-8}$	$1.3.10^{-8}$

Legend:
* - for adults f_1 = 0.1
** - for adults f_1 = 0.2
^{X} - for adults f_1 = 0.3

Conversion factors h_{ing} are used for conversion of intake of radionuclides to the committed effective dose after

ingestion of radioactive material by an individual from the population.
Conversion factors h_{ing} for intake via ingestion are provided depending on the absorption type in the digestive tract.
For unidentified radionuclides and chemical forms of radioactive substances, activity is attributed to those radionuclides and their forms for which the table stipulates the highest conversion factor.

Conversion factors h_{inh} for intake of radioactive aerosols by inhalation by an individual from the population

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
hydrogen									
H-3	F	1.0	$2.6.10^{-11}$	1.0	$2.0.10^{-11}$	$1.1.10^{-11}$	$8.2.10^{-12}$	$5.9.10^{-12}$	$6.2.10^{-12}$
	M	0.2	$3.4.10^{-10}$	0.1	$2.7.10^{-10}$	$1.4.10^{-10}$	$8.2.10^{-11}$	$5.3.10^{-11}$	$4.5.10^{-11}$
	S	0.02	$1.2.10^{-9}$	0.01	$1.0.10^{-9}$	$6.3.10^{-10}$	$3.8.10^{-10}$	$2.8.10^{-10}$	$2.6.10^{-10}$
beryllium									
Be-7	M	0.02	$2.5.10^{-10}$	0.005	$2.1.10^{-10}$	$1.2.10^{-10}$	$8.3.10^{-11}$	$6.2.10^{-11}$	$5.0.10^{-11}$
	S	0.02	$2.8.10^{-10}$	0.005	$2.4.10^{-10}$	$1.4.10^{-10}$	$9.6.10^{-11}$	$6.8.10^{-11}$	$5.5.10^{-11}$
Be-10	M	0.02	$4.1.10^{-8}$	0.005	$3.4.10^{-8}$	$2.0.10^{-8}$	$1.3.10^{-8}$	$1.1.10^{-8}$	$9.6.10^{-9}$
	S	0.02	$9.9.10^{-8}$	0.005	$9.1.10^{-8}$	$6.1.10^{-8}$	$4.2.10^{-8}$	$3.7.10^{-8}$	$3.5.10^{-8}$
carbon									
C-11	F	1.0	$1.0.10^{-10}$	1.0	$7.0.10^{-11}$	$3.2.10^{-11}$	$2.1.10^{-11}$	$1.3.10^{-11}$	$1.1.10^{-11}$
	M	0.2	$1.5.10^{-10}$	0.1	$1.1.10^{-10}$	$4.9.10^{-11}$	$3.2.10^{-11}$	$2.1.10^{-11}$	$1.8.10^{-11}$
	S	0.02	$1.6.10^{-10}$	0.01	$1.1.10^{-10}$	$5.1.10^{-11}$	$3.3.10^{-11}$	$2.2.10^{-11}$	$1.8.10^{-11}$
C-14	F	1.0	$6.1.10^{-10}$	1.0	$6.7.10^{-10}$	$3.6.10^{-10}$	$2.9.10^{-10}$	$1.9.10^{-10}$	$2.0.10^{-10}$
	M	0.2	$8.3.10^{-9}$	0.1	$6.6.10^{-9}$	$4.0.10^{-9}$	$2.8.10^{-9}$	$2.5.10^{-9}$	$2.0.10^{-9}$
	S	0.02	$1.9.10^{-8}$	0.01	$1.7.10^{-8}$	$1.1.10^{-8}$	$7.4.10^{-9}$	$6.4.10^{-9}$	$5.8.10^{-9}$
fluorine									
F-18	F	1.0	$2.6.10^{-10}$	1.0	$1.9.10^{-10}$	$9.1.10^{-11}$	$5.6.10^{-11}$	$3.4.10^{-11}$	$2.8.10^{-11}$
	M	1.0	$4.1.10^{-10}$	1.0	$2.9.10^{-10}$	$1.5.10^{-10}$	$9.7.10^{-11}$	$6.9.10^{-11}$	$5.6.10^{-11}$
	S	1.0	$4.2.10^{-10}$	1.0	$3.1.10^{-10}$	$1.5.10^{-10}$	$1.0.10^{-10}$	$7.3.10^{-11}$	$5.9.10^{-11}$
sodium									
Na-22	F	1.0	$9.7.10^{-9}$	1.0	$7.3.10^{-9}$	$3.8.10^{-9}$	$2.4.10^{-9}$	$1.5.10^{-9}$	$1.3.10^{-9}$
Na-24	F	1.0	$2.3.10^{-9}$	1.0	$1.8.10^{-9}$	$9.3.10^{-10}$	$5.7.10^{-10}$	$3.4.10^{-10}$	$2.7.10^{-10}$
magnesium									
Mg-28	F	1.0	$5.3.10^{-9}$	0.5	$4.7.10^{-9}$	$2.2.10^{-9}$	$1.3.10^{-9}$	$7.3.10^{-10}$	$6.0.10^{-10}$
	M	1.0	$7.3.10^{-9}$	0.5	$7.2.10^{-9}$	$3.5.10^{-9}$	$2.3.10^{-9}$	$1.5.10^{-9}$	$1.2.10^{-9}$
aluminium									
Al-26	F	0.02	$8.1.10^{-8}$	0.01	$6.2.10^{-8}$	$3.2.10^{-8}$	$2.0.10^{-8}$	$1.3.10^{-8}$	$1.1.10^{-8}$
	M	0.02	$8.8.10^{-8}$	0.01	$7.4.10^{-8}$	$4.4.10^{-8}$	$2.9.10^{-8}$	$2.2.10^{-8}$	$2.0.10^{-8}$
silicon									
Si-31	F	0.02	$3.6.10^{-10}$	0.01	$2.3.10^{-10}$	$9.5.10^{-11}$	$5.9.10^{-11}$	$3.2.10^{-11}$	$2.7.10^{-11}$
	M	0.02	$6.9.10^{-10}$	0.01	$4.4.10^{-10}$	$2.0.10^{-10}$	$1.3.10^{-10}$	$8.9.10^{-11}$	$7.4.10^{-11}$
	S	0.02	$7.2.10^{-10}$	0.01	$4.7.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$9.5.10^{-11}$	$7.9.10^{-11}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
Si-32	F	0.02	$3.0.10^{-8}$	0.01	$2.3.10^{-8}$	$1.1.10^{-8}$	$6.4.10^{-9}$	$3.8.10^{-9}$	$3.2.10^{-9}$
	M	0.02	$7.1.10^{-8}$	0.01	$6.0.10^{-8}$	$3.6.10^{-8}$	$2.4.10^{-8}$	$1.9.10^{-8}$	$1.7.10^{-8}$
	S	0.02	$2.8.10^{-7}$	0.01	$2.7.10^{-7}$	$1.9.10^{-7}$	$1.3.10^{-7}$	$1.1.10^{-7}$	$1.1.10^{-7}$
phosphorus									
P-32	F	1.0	$1.2.10^{-8}$	0.8	$7.5.10^{-9}$	$3.2.10^{-9}$	$1.8.10^{-9}$	$9.8.10^{-10}$	$7.7.10^{-10}$
	M	1.0	$2.2.10^{-8}$	0.8	$1.5.10^{-8}$	$8.0.10^{-9}$	$5.3.10^{-9}$	$4.0.10^{-9}$	$3.4.10^{-9}$
P-33	F	1.0	$1.2.10^{-9}$	0.8	$7.8.10^{-10}$	$3.0.10^{-10}$	$2.0.10^{-10}$	$1.1.10^{-10}$	$9.2.10^{-11}$
	M	1.0	$6.1.10^{-9}$	0.8	$4.6.10^{-9}$	$2.8.10^{-9}$	$2.1.10^{-9}$	$1.9.10^{-9}$	$1.5.10^{-9}$
sulphur									
S-35	F	1.0	$5.5.10^{-10}$	0.8	$3.9.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$6.0.10^{-11}$	$5.1.10^{-11}$
anorg.	M	0.2	$5.9.10^{-9}$	0.1	$4.5.10^{-9}$	$2.8.10^{-9}$	$2.0.10^{-9}$	$1.8.10^{-9}$	$1.4.10^{-9}$
	S	0.02	$7.7.10^{-9}$	0.01	$6.0.10^{-9}$	$3.6.10^{-9}$	$2.6.10^{-9}$	$2.3.10^{-9}$	$1.9.10^{-9}$
chlorine									
Cl-36	F	1.0	$3.9.10^{-9}$	1.0	$2.6.10^{-9}$	$1.1.10^{-9}$	$7.1.10^{-10}$	$3.9.10^{-10}$	$3.3.10^{-10}$
	M	1.0	$3.1.10^{-8}$	1.0	$2.6.10^{-8}$	$1.5.10^{-8}$	$1.0.10^{-8}$	$8.8.10^{-9}$	$7.3.10^{-9}$
Cl-38	F	1.0	$2.9.10^{-10}$	1.0	$1.9.10^{-10}$	$8.4.10^{-11}$	$5.1.10^{-11}$	$3.0.10^{-11}$	$2.5.10^{-11}$
	M	1.0	$4.7.10^{-10}$	1.0	$3.0.10^{-10}$	$1.4.10^{-10}$	$8.5.10^{-11}$	$5.4.10^{-11}$	$4.5.10^{-11}$
Cl-39	F	1.0	$2.7.10^{-10}$	1.0	$1.8.10^{-10}$	$8.4.10^{-11}$	$5.1.10^{-11}$	$3.1.10^{-11}$	$2.5.10^{-11}$
	M	1.0	$4.3.10^{-10}$	1.0	$2.8.10^{-10}$	$1.3.10^{-10}$	$8.5.10^{-11}$	$5.6.10^{-11}$	$4.6.10^{-11}$
potassium									
K-40	F	1.0	$2.4.10^{-8}$	1.0	$1.7.10^{-8}$	$7.5.10^{-9}$	$4.5.10^{-9}$	$2.5.10^{-9}$	$2.1.10^{-9}$
K-42	F	1.0	$1.6.10^{-9}$	1.0	$1.0.10^{-9}$	$4.4.10^{-10}$	$2.6.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
K-43	F	1.0	$1.3.10^{-9}$	1.0	$9.7.10^{-10}$	$4.7.10^{-10}$	$2.9.10^{-10}$	$1.7.10^{-10}$	$1.4.10^{-10}$
K-44	F	1.0	$2.2.10^{-10}$	1.0	$1.4.10^{-10}$	$6.5.10^{-11}$	$4.0.10^{-11}$	$2.4.10^{-11}$	$2.0.10^{-11}$
K-45	F	1.0	$1.5.10^{-10}$	1.0	$1.0.10^{-10}$	$4.8.10^{-11}$	$3.0.10^{-11}$	$1.8.10^{-11}$	$1.5.10^{-11}$
calcium									
Ca-41	F	0.6	$6.7.10^{-10}$	0.4^{X}	$3.8.10^{-10}$	$2.6.10^{-10}$	$3.3.10^{-10}$	$3.3.10^{-10}$	$1.7.10^{-10}$
	M	0.2	$4.2.10^{-10}$	0.1	$2.6.10^{-10}$	$1.7.10^{-10}$	$1.7.10^{-10}$	$1.6.10^{-10}$	$9.5.10^{-11}$
	S	0.02	$6.7.10^{-10}$	0.01	$6.0.10^{-10}$	$3.8.10^{-10}$	$2.4.10^{-10}$	$1.9.10^{-10}$	$1.8.10^{-10}$
Ca-45	F	0.6	$5.7.10^{-9}$	0.4^{X}	$3.0.10^{-9}$	$1.4.10^{-9}$	$1.0.10^{-9}$	$7.6.10^{-10}$	$4.6.10^{-10}$
	M	0.2	$1.2.10^{-8}$	0.1	$8.8.10^{-9}$	$5.3.10^{-9}$	$3.9.10^{-9}$	$3.5.10^{-9}$	$2.7.10^{-9}$
	S	0.02	$1.5.10^{-8}$	0.01	$1.2.10^{-8}$	$7.2.10^{-9}$	$5.1.10^{-9}$	$4.6.10^{-9}$	$3.7.10^{-9}$
Ca-47	F	0.6	$4.9.10^{-9}$	0.4^{X}	$3.6.10^{-9}$	$1.7.10^{-9}$	$1.1.10^{-9}$	$6.1.10^{-10}$	$5.5.10^{-10}$
	M	0.2	$1.0.10^{-8}$	0.1	$7.7.10^{-9}$	$4.2.10^{-9}$	$2.9.10^{-9}$	$2.4.10^{-9}$	$1.9.10^{-9}$
	S	0.02	$1.2.10^{-8}$	0.01	$8.5.10^{-9}$	$4.6.10^{-9}$	$3.3.10^{-9}$	$2.6.10^{-9}$	$2.1.10^{-9}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
scandium									
Sc-43	S	0.001	$9.3.10^{-10}$	$1.0.10^{-4}$	$6.7.10^{-10}$	$3.3.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
Sc-44	S	0.001	$1.6.10^{-9}$	$1.0.10^{-4}$	$1.2.10^{-9}$	$5.6.10^{-10}$	$3.6.10^{-10}$	$2.3.10^{-10}$	$1.8.10^{-10}$
Sc-44m	S	0.001	$1.1.10^{-8}$	$1.0.10^{-4}$	$8.4.10^{-9}$	$4.2.10^{-9}$	$2.8.10^{-9}$	$1.7.10^{-9}$	$1.4.10^{-9}$
Sc-46	S	0.001	$2.8.10^{-8}$	$1.0.10^{-4}$	$2.3.10^{-8}$	$1.4.10^{-8}$	$9.8.10^{-9}$	$8.4.10^{-9}$	$6.8.10^{-9}$
Sc-47	S	0.001	$4.0.10^{-9}$	$1.0.10^{-4}$	$2.8.10^{-9}$	$1.5.10^{-9}$	$1.1.10^{-9}$	$9.2.10^{-10}$	$7.3.10^{-10}$
Sc-48	S	0.001	$7.8.10^{-9}$	$1.0.10^{-4}$	$5.9.10^{-9}$	$3.1.10^{-9}$	$2.0.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
Sc-49	S	0.001	$3.9.10^{-10}$	$1.0.10^{-4}$	$2.4.10^{-10}$	$1.1.10^{-10}$	$7.1.10^{-11}$	$4.7.10^{-11}$	$4.0.10^{-11}$
titanium									
Ti-44	F	0.02	$3.1.10^{-7}$	0.01	$2.6.10^{-7}$	$1.5.10^{-7}$	$9.6.10^{-8}$	$6.6.10^{-8}$	$6.1.10^{-8}$
	M	0.02	$1.7.10^{-7}$	0.01	$1.5.10^{-7}$	$9.2.10^{-8}$	$5.9.10^{-8}$	$4.6.10^{-8}$	$4.2.10^{-8}$
	S	0.02	$3.2.10^{-7}$	0.01	$3.1.10^{-7}$	$2.1.10^{-7}$	$1.5.10^{-7}$	$1.3.10^{-7}$	$1.2.10^{-7}$
Ti-45	F	0.02	$4.4.10^{-10}$	0.01	$3.2.10^{-10}$	$1.5.10^{-10}$	$9.1.10^{-11}$	$5.1.10^{-11}$	$4.2.10^{-11}$
	M	0.02	$7.4.10^{-10}$	0.01	$5.2.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$8.8.10^{-11}$
	S	0.02	$7.7.10^{-10}$	0.01	$5.5.10^{-10}$	$2.7.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$9.3.10^{-11}$
vanadium									
V-47	F	0.02	$1.8.10^{-10}$	0.01	$1.2.10^{-10}$	$5.6.10^{-11}$	$3.5.10^{-11}$	$2.1.10^{-11}$	$1.7.10^{-11}$
	M	0.02	$2.8.10^{-10}$	0.01	$1.9.10^{-10}$	$8.6.10^{-11}$	$5.5.10^{-11}$	$3.5.10^{-11}$	$2.9.10^{-11}$
V-48	F	0.02	$8.4.10^{-9}$	0.01	$6.4.10^{-9}$	$3.3.10^{-9}$	$2.1.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$
	M	0.02	$1.4.10^{-8}$	0.01	$1.1.10^{-8}$	$6.3.10^{-9}$	$4.3.10^{-9}$	$2.9.10^{-9}$	$2.4.10^{-9}$
V-49	F	0.02	$2.0.10^{-10}$	0.01	$1.6.10^{-10}$	$7.7.10^{-11}$	$4.3.10^{-11}$	$2.5.10^{-11}$	$2.1.10^{-11}$
	M	0.02	$2.8.10^{-10}$	0.01	$2.1.10^{-10}$	$1.1.10^{-10}$	$6.3.10^{-11}$	$4.0.10^{-11}$	$3.4.10^{-11}$
chromium									
Cr-48	F	0.2	$7.6.10^{-10}$	0.1	$6.0.10^{-10}$	$3.1.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$9.9.10^{-11}$
	M	0.2	$1.1.10^{-9}$	0.1	$9.1.10^{-10}$	$5.1.10^{-10}$	$3.4.10^{-10}$	$2.5.10^{-10}$	$2.0.10^{-10}$
	S	0.2	$1.2.10^{-9}$	0.1	$9.8.10^{-10}$	$5.5.10^{-10}$	$3.7.10^{-10}$	$2.8.10^{-10}$	$2.2.10^{-10}$
Cr-49	F	0.2	$1.9.10^{-10}$	0.1	$1.3.10^{-10}$	$6.0.10^{-11}$	$3.7.10^{-11}$	$2.2.10^{-11}$	$1.9.10^{-11}$
	M	0.2	$3.0.10^{-10}$	0.1	$2.0.10^{-10}$	$9.5.10^{-11}$	$6.1.10^{-11}$	$4.0.10^{-11}$	$3.3.10^{-11}$
	S	0.2	$3.1.10^{-10}$	0.1	$2.1.10^{-10}$	$9.9.10^{-11}$	$6.4.10^{-11}$	$4.2.10^{-11}$	$3.5.10^{-11}$
Cr-51	F	0.2	$1.7.10^{-10}$	0.1	$1.3.10^{-10}$	$6.3.10^{-11}$	$4.0.10^{-11}$	$2.4.10^{-11}$	$2.0.10^{-11}$
	M	0.2	$2.6.10^{-10}$	0.1	$1.9.10^{-10}$	$1.0.10^{-10}$	$6.4.10^{-11}$	$3.9.10^{-11}$	$3.2.10^{-11}$
	S	0.2	$2.6.10^{-10}$	0.1	$2.1.10^{-10}$	$1.0.10^{-10}$	$6.6.10^{-11}$	$4.5.10^{-11}$	$3.7.10^{-11}$
manganese									
Mn-51	F	0.2	$2.5.10^{-10}$	0.1	$1.7.10^{-10}$	$7.5.10^{-11}$	$4.6.10^{-11}$	$2.7.10^{-11}$	$2.3.10^{-11}$
	M	0.2	$4.0.10^{-10}$	0.1	$2.7.10^{-10}$	$1.2.10^{-10}$	$7.8.10^{-11}$	$5.0.10^{-11}$	$4.1.10^{-11}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Mn-52	F	0.2	$7.0.10^{-9}$	0.1	$5.5.10^{-9}$	$2.9.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$9.4.10^{-10}$
	M	0.2	$8.6.10^{-9}$	0.1	$6.8.10^{-9}$	$3.7.10^{-9}$	$2.4.10^{-9}$	$1.7.10^{-9}$	$1.4.10^{-9}$
Mn-52m	F	0.2	$1.9.10^{-10}$	0.1	$1.3.10^{-10}$	$6.1.10^{-11}$	$3.8.10^{-11}$	$2.2.10^{-11}$	$1.9.10^{-11}$
	M	0.2	$2.8.10^{-10}$	0.1	$1.9.10^{-10}$	$8.7.10^{-11}$	$5.5.10^{-11}$	$3.4.10^{-11}$	$2.9.10^{-11}$
Mn-53	F	0.2	$3.2.10^{-10}$	0.1	$2.2.10^{-10}$	$1.1.10^{-10}$	$6.0.10^{-11}$	$3.4.10^{-11}$	$2.9.10^{-11}$
	M	0.2	$4.6.10^{-10}$	0.1	$3.4.10^{-10}$	$1.7.10^{-10}$	$1.0.10^{-10}$	$6.4.10^{-11}$	$5.4.10^{-11}$
Mn-54	F	0.2	$5.2.10^{-9}$	0.1	$4.1.10^{-9}$	$2.2.10^{-9}$	$1.5.10^{-9}$	$9.9.10^{-10}$	$8.5.10^{-10}$
	M	0.2	$7.5.10^{-9}$	0.1	$6.2.10^{-9}$	$3.8.10^{-9}$	$2.4.10^{-9}$	$1.9.10^{-9}$	$1.5.10^{-9}$
Mn-56	F	0.2	$6.9.10^{-10}$	0.1	$4.9.10^{-10}$	$2.3.10^{-10}$	$1.4.10^{-10}$	$7.8.10^{-11}$	$6.4.10^{-11}$
	M	0.2	$1.1.10^{-9}$	0.1	$7.8.10^{-10}$	$3.7.10^{-10}$	$2.4.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
iron									
Fe-52	F	0.6	$5.2.10^{-9}$	0.2*	$3.6.10^{-9}$	$1.5.10^{-9}$	$8.9.10^{-10}$	$4.9.10^{-10}$	$3.9.10^{-10}$
	M	0.2	$5.8.10^{-9}$	0.1	$4.1.10^{-9}$	$1.9.10^{-9}$	$1.2.10^{-9}$	$7.4.10^{-10}$	$6.0.10^{-10}$
	S	0.02	$6.0.10^{-9}$	0.01	$4.2.10^{-9}$	$2.0.10^{-9}$	$1.3.10^{-9}$	$7.7.10^{-10}$	$6.3.10^{-10}$
Fe-55	F	0.6	$4.2.10^{-9}$	0.2*	$3.2.10^{-9}$	$2.2.10^{-9}$	$1.4.10^{-9}$	$9.4.10^{-10}$	$7.7.10^{-10}$
	M	0.2	$1.9.10^{-9}$	0.1	$1.4.10^{-9}$	$9.9.10^{-10}$	$6.2.10^{-10}$	$4.4.10^{-10}$	$3.8.10^{-10}$
	S	0.02	$1.0.10^{-9}$	0.01	$8.5.10^{-10}$	$5.0.10^{-10}$	$2.9.10^{-10}$	$2.0.10^{-10}$	$1.8.10^{-10}$
Fe-59	F	0.6	$2.1.10^{-8}$	0.2*	$1.3.10^{-8}$	$7.1.10^{-9}$	$4.2.10^{-9}$	$2.6.10^{-9}$	$2.2.10^{-9}$
	M	0.2	$1.8.10^{-8}$	0.1	$1.3.10^{-8}$	$7.9.10^{-9}$	$5.5.10^{-9}$	$4.6.10^{-9}$	$3.7.10^{-9}$
	S	0.02	$1.7.10^{-8}$	0.01	$1.3.10^{-8}$	$8.1.10^{-9}$	$5.8.10^{-9}$	$5.1.10^{-9}$	$4.0.10^{-9}$
Fe-60	F	0.6	$4.4.10^{-7}$	0.2*	$3.9.10^{-7}$	$3.5.10^{-7}$	$3.2.10^{-7}$	$2.9.10^{-7}$	$2.8.10^{-7}$
	M	0.2	$2.0.10^{-7}$	0.1	$1.7.10^{-7}$	$1.6.10^{-7}$	$1.4.10^{-7}$	$1.4.10^{-7}$	$1.4.10^{-7}$
	S	0.02	$9.3.10^{-8}$	0.01	$8.8.10^{-8}$	$6.7.10^{-8}$	$5.2.10^{-8}$	$4.9.10^{-8}$	$4.9.10^{-8}$
cobalt									
Co-55	F	0.6	$2.2.10^{-9}$	0.3*	$1.8.10^{-9}$	$9.0.10^{-10}$	$5.5.10^{-10}$	$3.1.10^{-10}$	$2.7.10^{-10}$
	M	0.2	$4.1.10^{-9}$	0.1	$3.1.10^{-9}$	$1.5.10^{-9}$	$9.8.10^{-10}$	$6.1.10^{-10}$	$5.0.10^{-10}$
	S	0.02	$4.6.10^{-9}$	0.01	$3.3.10^{-9}$	$1.6.10^{-9}$	$1.1.10^{-9}$	$6.6.10^{-10}$	$5.3.10^{-10}$
Co-56	F	0.6	$1.4.10^{-8}$	0.3*	$1.0.10^{-8}$	$5.5.10^{-9}$	$3.5.10^{-9}$	$2.2.10^{-9}$	$1.8.10^{-9}$
	M	0.2	$2.5.10^{-8}$	0.1	$2.1.10^{-8}$	$1.1.10^{-8}$	$7.4.10^{-9}$	$5.8.10^{-9}$	$4.8.10^{-9}$
	S	0.02	$2.9.10^{-8}$	0.01	$2.5.10^{-8}$	$1.5.10^{-8}$	$1.0.10^{-8}$	$8.0.10^{-9}$	$6.7.10^{-9}$
Co-57	F	0.6	$1.5.10^{-9}$	0.3*	$1.1.10^{-9}$	$5.6.10^{-10}$	$3.7.10^{-10}$	$2.3.10^{-10}$	$1.9.10^{-10}$
	M	0.2	$2.8.10^{-9}$	0.1	$2.2.10^{-9}$	$1.3.10^{-9}$	$8.5.10^{-10}$	$6.7.10^{-10}$	$5.5.10^{-10}$
	S	0.02	$4.4.10^{-9}$	0.01	$3.7.10^{-9}$	$2.3.10^{-9}$	$1.5.10^{-9}$	$1.2.10^{-9}$	$1.0.10^{-9}$
Co-58	F	0.6	$4.0.10^{-9}$	0.3*	$3.0.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$6.4.10^{-10}$	$5.3.10^{-10}$
	M	0.2	$7.3.10^{-9}$	0.1	$6.5.10^{-9}$	$3.5.10^{-9}$	$2.4.10^{-9}$	$2.0.10^{-9}$	$1.6.10^{-9}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
	S	0.02	$9.0.10^{-9}$	0.01	$7.5.10^{-9}$	$4.5.10^{-9}$	$3.1.10^{-9}$	$2.6.10^{-9}$	$2.1.10^{-9}$
Co-58m	F	0.6	$4.8.10^{-11}$	0.3*	$3.6.10^{-11}$	$1.7.10^{-11}$	$1.1.10^{-11}$	$5.9.10^{-12}$	$5.2.10^{-12}$
	M	0.2	$1.1.10^{-10}$	0.1	$7.6.10^{-11}$	$3.8.10^{-11}$	$2.4.10^{-11}$	$1.6.10^{-11}$	$1.3.10^{-11}$
	S	0.02	$1.3.10^{-10}$	0.01	$9.0.10^{-11}$	$4.5.10^{-11}$	$3.0.10^{-11}$	$2.0.10^{-11}$	$1.7.10^{-11}$
Co-60	F	0.6	$3.0.10^{-8}$	0.3*	$2.3.10^{-8}$	$1.4.10^{-8}$	$8.9.10^{-9}$	$6.1.10^{-9}$	$5.2.10^{-9}$
	M	0.2	$4.2.10^{-8}$	0.1	$3.4.10^{-8}$	$2.1.10^{-8}$	$1.5.10^{-8}$	$1.2.10^{-8}$	$1.0.10^{-8}$
	S	0.02	$9.2.10^{-8}$	0.01	$8.6.10^{-8}$	$5.9.10^{-8}$	$4.0.10^{-8}$	$3.4.10^{-8}$	$3.1.10^{-8}$
Co-60m	F	0.6	$4.4.10^{-12}$	0.3*	$2.8.10^{-12}$	$1.5.10^{-12}$	$1.0.10^{-12}$	$8.3.10^{-13}$	$6.9.10^{-13}$
	M	0.2	$7.1.10^{-12}$	0.1	$4.7.10^{-12}$	$2.7.10^{-12}$	$1.8.10^{-12}$	$1.5.10^{-12}$	$1.2.10^{-12}$
	S	0.02	$7.6.10^{-12}$	0.01	$5.1.10^{-12}$	$2.9.10^{-12}$	$2.0.10^{-12}$	$1.7.10^{-12}$	$1.4.10^{-12}$
Co-61	F	0.6	$2.1.10^{-10}$	0.3*	$1.4.10^{-10}$	$6.0.10^{-11}$	$3.8.10^{-11}$	$2.2.10^{-11}$	$1.9.10^{-11}$
	M	0.2	$4.0.10^{-10}$	0.1	$2.7.10^{-10}$	$1.2.10^{-10}$	$8.2.10^{-11}$	$5.7.10^{-11}$	$4.7.10^{-11}$
	S	0.02	$4.3.10^{-10}$	0.01	$2.8.10^{-10}$	$1.3.10^{-10}$	$8.8.10^{-11}$	$6.1.10^{-11}$	$5.1.10^{-11}$
Co-62m	F	0.6	$1.4.10^{-10}$	0.3*	$9.5.10^{-11}$	$4.5.10^{-11}$	$2.8.10^{-11}$	$1.7.10^{-11}$	$1.4.10^{-11}$
	M	0.2	$1.9.10^{-10}$	0.1	$1.3.10^{-10}$	$6.1.10^{-11}$	$3.8.10^{-11}$	$2.4.10^{-11}$	$2.0.10^{-11}$
	S	0.02	$2.0.10^{-10}$	0.01	$1.3.10^{-10}$	$6.3.10^{-11}$	$4.0.10^{-11}$	$2.5.10^{-11}$	$2.1.10^{-11}$
nickel									
Ni-56	F	0.1	$3.3.10^{-9}$	0.05	$2.8.10^{-9}$	$1.5.10^{-9}$	$9.3.10^{-10}$	$5.8.10^{-10}$	$4.9.10^{-10}$
	M	0.1	$4.9.10^{-9}$	0.05	$4.1.10^{-9}$	$2.3.10^{-9}$	$1.5.10^{-9}$	$1.1.10^{-9}$	$8.7.10^{-10}$
	S	0.02	$5.5.10^{-9}$	0.01	$4.6.10^{-9}$	$2.7.10^{-9}$	$1.8.10^{-9}$	$1.3.10^{-9}$	$1.0.10^{-9}$
Ni-57	F	0.1	$2.2.10^{-9}$	0.05	$1.8.10^{-9}$	$8.9.10^{-10}$	$5.5.10^{-10}$	$3.1.10^{-10}$	$2.5.10^{-10}$
	M	0.1	$3.6.10^{-9}$	0.05	$2.8.10^{-9}$	$1.5.10^{-9}$	$9.5.10^{-10}$	$6.2.10^{-10}$	$5.0.10^{-10}$
	S	0.02	$3.9.10^{-9}$	0.01	$3.0.10^{-9}$	$1.5.10^{-9}$	$1.0.10^{-9}$	$6.6.10^{-10}$	$5.3.10^{-10}$
Ni-59	F	0.1	$9.6.10^{-10}$	0.05	$8.1.10^{-10}$	$4.5.10^{-10}$	$2.8.10^{-10}$	$1.9.10^{-10}$	$1.8.10^{-10}$
	M	0.1	$7.9.10^{-10}$	0.05	$6.2.10^{-10}$	$3.4.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$1.3.10^{-10}$
	S	0.02	$1.7.10^{-9}$	0.01	$1.5.10^{-9}$	$9.5.10^{-10}$	$5.9.10^{-10}$	$4.6.10^{-10}$	$4.4.10^{-10}$
Ni-63	F	0.1	$2.3.10^{-9}$	0.05	$2.0.10^{-9}$	$1.1.10^{-9}$	$6.7.10^{-10}$	$4.6.10^{-10}$	$4.4.10^{-10}$
	M	0.1	$2.5.10^{-9}$	0.05	$1.9.10^{-9}$	$1.1.10^{-9}$	$7.0.10^{-10}$	$5.3.10^{-10}$	$4.8.10^{-10}$
	S	0.02	$4.8.10^{-9}$	0.01	$4.3.10^{-9}$	$2.7.10^{-9}$	$1.7.10^{-9}$	$1.3.10^{-9}$	$1.3.10^{-9}$
Ni-65	F	0.1	$4.4.10^{-10}$	0.05	$3.0.10^{-10}$	$1.4.10^{-10}$	$8.5.10^{-11}$	$4.9.10^{-11}$	$4.1.10^{-11}$
	M	0.1	$7.7.10^{-10}$	0.05	$5.2.10^{-10}$	$2.4.10^{-10}$	$1.6.10^{-10}$	$1.0.10^{-10}$	$8.5.10^{-11}$
	S	0.02	$8.1.10^{-10}$	0.01	$5.5.10^{-10}$	$2.6.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$9.0.10^{-11}$
Ni-66	F	0.1	$5.7.10^{-9}$	0.05	$3.8.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$5.1.10^{-10}$	$4.2.10^{-10}$
	M	0.1	$1.3.10^{-8}$	0.05	$9.4.10^{-9}$	$4.5.10^{-9}$	$2.9.10^{-9}$	$2.0.10^{-9}$	$1.6.10^{-9}$
	S	0.02	$1.5.10^{-8}$	0.01	$1.0.10^{-8}$	$5.0.10^{-9}$	$3.2.10^{-9}$	$2.2.10^{-9}$	$1.8.10^{-9}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
copper									
Cu-60	F	1.0	$2.1.10^{-10}$	0.5	$1.6.10^{-10}$	$7.5.10^{-11}$	$4.6.10^{-11}$	$2.8.10^{-11}$	$2.3.10^{-11}$
	M	1.0	$3.0.10^{-10}$	0.5	$2.2.10^{-10}$	$1.0.10^{-10}$	$6.5.10^{-11}$	$4.0.10^{-11}$	$3.3.10^{-11}$
	S	1.0	$3.1.10^{-10}$	0.5	$2.2.10^{-10}$	$1.1.10^{-10}$	$6.7.10^{-11}$	$4.2.10^{-11}$	$3.4.10^{-11}$
Cu-61	F	1.0	$3.1.10^{-10}$	0.5	$2.7.10^{-10}$	$1.3.10^{-10}$	$7.9.10^{-11}$	$4.5.10^{-11}$	$3.7.10^{-11}$
	M	1.0	$4.9.10^{-10}$	0.5	$4.4.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$9.1.10^{-11}$	$7.4.10^{-11}$
	S	1.0	$5.1.10^{-10}$	0.5	$4.5.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$9.6.10^{-11}$	$7.8.10^{-11}$
Cu-64	F	1.0	$2.8.10^{-10}$	0.5	$2.7.10^{-10}$	$1.2.10^{-10}$	$7.6.10^{-11}$	$4.2.10^{-11}$	$3.5.10^{-11}$
	M	1.0	$5.5.10^{-10}$	0.5	$5.4.10^{-10}$	$2.7.10^{-10}$	$1.9.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
	S	1.0	$5.8.10^{-10}$	0.5	$5.7.10^{-10}$	$2.9.10^{-10}$	$2.0.10^{-10}$	$1.3.10^{-10}$	$1.2.10^{-10}$
Cu-67	F	1.0	$9.5.10^{-10}$	0.5	$8.0.10^{-10}$	$3.5.10^{-10}$	$2.2.10^{-10}$	$1.2.10^{-10}$	$1.0.10^{-10}$
	M	1.0	$2.3.10^{-9}$	0.5	$2.0.10^{-9}$	$1.1.10^{-9}$	$8.1.10^{-10}$	$6.9.10^{-10}$	$5.5.10^{-10}$
	S	1.0	$2.5.10^{-9}$	0.5	$2.1.10^{-9}$	$1.2.10^{-9}$	$8.9.10^{-10}$	$7.7.10^{-10}$	$6.1.10^{-10}$
zinc									
Zn-62	F	1.0	$1.7.10^{-9}$	0.5	$1.7.10^{-9}$	$7.7.10^{-10}$	$4.6.10^{-10}$	$2.5.10^{-10}$	$2.0.10^{-10}$
	M	0.2	$4.5.10^{-9}$	0.1	$3.5.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$6.0.10^{-10}$	$5.0.10^{-10}$
	S	0.02	$5.1.10^{-9}$	0.01	$3.4.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$6.6.10^{-10}$	$5.5.10^{-10}$
Zn-63	F	1.0	$2.1.10^{-10}$	0.5	$1.4.10^{-10}$	$6.5.10^{-11}$	$4.0.10^{-11}$	$2.4.10^{-11}$	$2.0.10^{-11}$
	M	0.2	$3.4.10^{-10}$	0.1	$2.3.10^{-10}$	$1.0.10^{-10}$	$6.6.10^{-11}$	$4.2.10^{-11}$	$3.5.10^{-11}$
	S	0.02	$3.6.10^{-10}$	0.01	$2.4.10^{-10}$	$1.1.10^{-10}$	$6.9.10^{-11}$	$4.4.10^{-11}$	$3.7.10^{-11}$
Zn-65	F	1.0	$1.5.10^{-8}$	0.5	$1.0.10^{-8}$	$5.7.10^{-9}$	$3.8.10^{-9}$	$2.5.10^{-9}$	$2.2.10^{-9}$
	M	0.2	$8.5.10^{-9}$	0.1	$6.5.10^{-9}$	$3.7.10^{-9}$	$2.4.10^{-9}$	$1.9.10^{-9}$	$1.6.10^{-9}$
	S	0.02	$7.6.10^{-9}$	0.01	$6.7.10^{-9}$	$4.4.10^{-9}$	$2.9.10^{-9}$	$2.4.10^{-9}$	$2.0.10^{-9}$
Zn-69	F	1.0	$1.1.10^{-10}$	0.5	$7.4.10^{-11}$	$3.2.10^{-11}$	$2.1.10^{-11}$	$1.2.10^{-11}$	$1.1.10^{-11}$
	M	0.2	$2.2.10^{-10}$	0.1	$1.4.10^{-10}$	$6.5.10^{-11}$	$4.4.10^{-11}$	$3.1.10^{-11}$	$2.6.10^{-11}$
	S	0.02	$2.3.10^{-10}$	0.01	$1.5.10^{-10}$	$6.9.10^{-11}$	$4.7.10^{-11}$	$3.4.10^{-11}$	$2.8.10^{-11}$
Zn-69m	F	1.0	$6.6.10^{-10}$	0.5	$6.7.10^{-10}$	$3.0.10^{-10}$	$1.8.10^{-10}$	$9.9.10^{-11}$	$8.2.10^{-11}$
	M	0.2	$2.1.10^{-9}$	0.1	$1.5.10^{-9}$	$7.5.10^{-10}$	$5.0.10^{-10}$	$3.0.10^{-10}$	$2.4.10^{-10}$
	S	0.02	$2.2.10^{-9}$	0.01	$1.7.10^{-9}$	$8.2.10^{-10}$	$5.4.10^{-10}$	$3.3.10^{-10}$	$2.7.10^{-10}$
Zn-71m	F	1.0	$6.2.10^{-10}$	0.5	$5.5.10^{-10}$	$2.6.10^{-10}$	$1.6.10^{-10}$	$9.1.10^{-11}$	$7.4.10^{-11}$
	M	0.2	$1.3.10^{-9}$	0.1	$9.4.10^{-10}$	$4.6.10^{-10}$	$2.9.10^{-10}$	$1.9.10^{-10}$	$1.5.10^{-10}$
	S	0.02	$1.4.10^{-9}$	0.01	$1.0.10^{-9}$	$4.9.10^{-10}$	$3.1.10^{-10}$	$2.0.10^{-10}$	$1.6.10^{-10}$
Zn-72	F	1.0	$4.3.10^{-9}$	0.5	$3.5.10^{-9}$	$1.7.10^{-9}$	$1.0.10^{-9}$	$5.9.10^{-10}$	$4.9.10^{-10}$
	M	0.2	$8.8.10^{-9}$	0.1	$6.5.10^{-9}$	$3.4.10^{-9}$	$2.3.10^{-9}$	$1.5.10^{-9}$	$1.2.10^{-9}$
	S	0.02	$9.7.10^{-9}$	0.01	$7.0.10^{-9}$	$3.6.10^{-9}$	$2.4.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
gallium									
Ga-65	F	0.01	$1.1.10^{-10}$	0.001	$7.3.10^{-11}$	$3.4.10^{-11}$	$2.1.10^{-11}$	$1.3.10^{-11}$	$1.1.10^{-11}$
	M	0.01	$1.6.10^{-10}$	0.001	$1.1.10^{-10}$	$4.8.10^{-11}$	$3.1.10^{-11}$	$2.0.10^{-11}$	$1.7.10^{-11}$
Ga-66	F	0.01	$2.8.10^{-9}$	0.001	$2.0.10^{-9}$	$9.2.10^{-10}$	$5.7.10^{-10}$	$3.0.10^{-10}$	$2.5.10^{-10}$
	M	0.01	$4.5.10^{-9}$	0.001	$3.1.10^{-9}$	$1.5.10^{-9}$	$9.2.10^{-10}$	$5.3.10^{-10}$	$4.4.10^{-10}$
Ga-67	F	0.01	$6.4.10^{-10}$	0.001	$4.6.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$7.7.10^{-11}$	$6.4.10^{-11}$
	M	0.01	$1.4.10^{-9}$	0.001	$1.0.10^{-9}$	$5.0.10^{-10}$	$3.6.10^{-10}$	$3.0.10^{-10}$	$2.4.10^{-10}$
Ga-68	F	0.01	$2.9.10^{-10}$	0.001	$1.9.10^{-10}$	$8.8.10^{-11}$	$5.4.10^{-11}$	$3.1.10^{-11}$	$2.6.10^{-11}$
	M	0.01	$4.6.10^{-10}$	0.001	$3.1.10^{-10}$	$1.4.10^{-10}$	$9.2.10^{-11}$	$5.9.10^{-11}$	$4.9.10^{-11}$
Ga-70	F	0.01	$9.5.10^{-11}$	0.001	$6.0.10^{-11}$	$2.6.10^{-11}$	$1.6.10^{-11}$	$1.0.10^{-11}$	$8.8.10^{-12}$
	M	0.01	$1.5.10^{-10}$	0.001	$9.6.10^{-11}$	$4.3.10^{-11}$	$2.8.10^{-11}$	$1.8.10^{-11}$	$1.6.10^{-11}$
Ga-72	F	0.01	$2.9.10^{-9}$	0.001	$2.2.10^{-9}$	$1.0.10^{-9}$	$6.4.10^{-10}$	$3.6.10^{-10}$	$2.9.10^{-10}$
	M	0.01	$4.5.10^{-9}$	0.001	$3.3.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$6.5.10^{-10}$	$5.3.10^{-10}$
Ga-73	F	0.01	$6.7.10^{-10}$	0.001	$4.5.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$6.4.10^{-11}$	$5.4.10^{-11}$
	M	0.01	$1.2.10^{-9}$	0.001	$8.4.10^{-10}$	$4.0.10^{-10}$	$2.6.10^{-10}$	$1.7.10^{-10}$	$1.4.10^{-10}$
germanium									
Ge-66	F	1.0	$4.5.10^{-10}$	1.0	$3.5.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$6.7.10^{-11}$	$5.4.10^{-11}$
	M	1.0	$6.4.10^{-10}$	1.0	$4.8.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$9.1.10^{-11}$
Ge-67	F	1.0	$1.7.10^{-10}$	1.0	$1.1.10^{-10}$	$4.9.10^{-11}$	$3.1.10^{-11}$	$1.8.10^{-11}$	$1.5.10^{-11}$
	M	1.0	$2.5.10^{-10}$	1.0	$1.6.10^{-10}$	$7.3.10^{-11}$	$4.6.10^{-11}$	$2.9.10^{-11}$	$2.5.10^{-11}$
Ge-68	F	1.0	$5.4.10^{-9}$	1.0	$3.8.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$6.3.10^{-10}$	$5.2.10^{-10}$
	M	1.0	$6.0.10^{-8}$	1.0	$5.0.10^{-8}$	$3.0.10^{-8}$	$2.0.10^{-8}$	$1.6.10^{-8}$	$1.4.10^{-8}$
Ge-69	F	1.0	$1.2.10^{-9}$	1.0	$9.0.10^{-10}$	$4.6.10^{-10}$	$2.8.10^{-10}$	$1.7.10^{-10}$	$1.3.10^{-10}$
	M	1.0	$1.8.10^{-9}$	1.0	$1.4.10^{-9}$	$7.4.10^{-10}$	$4.9.10^{-10}$	$3.6.10^{-10}$	$2.9.10^{-10}$
Ge-71	F	1.0	$6.0.10^{-11}$	1.0	$4.3.10^{-11}$	$2.0.10^{-11}$	$1.1.10^{-11}$	$6.1.10^{-12}$	$4.8.10^{-12}$
	M	1.0	$1.2.10^{-10}$	1.0	$8.6.10^{-11}$	$4.1.10^{-11}$	$2.4.10^{-11}$	$1.3.10^{-11}$	$1.1.10^{-11}$
Ge-75	F	1.0	$1.6.10^{-10}$	1.0	$1.0.10^{-10}$	$4.3.10^{-11}$	$2.8.10^{-11}$	$1.7.10^{-11}$	$1.5.10^{-11}$
	M	1.0	$2.9.10^{-10}$	1.0	$1.9.10^{-10}$	$8.9.10^{-11}$	$6.1.10^{-11}$	$4.4.10^{-11}$	$3.6.10^{-11}$
Ge-77	F	1.0	$1.3.10^{-9}$	1.0	$9.5.10^{-10}$	$4.7.10^{-10}$	$2.9.10^{-10}$	$1.7.10^{-10}$	$1.4.10^{-10}$
	M	1.0	$2.3.10^{-9}$	1.0	$1.7.10^{-9}$	$8.8.10^{-10}$	$6.0.10^{-10}$	$4.5.10^{-10}$	$3.7.10^{-10}$
Ge-78	F	1.0	$4.3.10^{-10}$	1.0	$2.9.10^{-10}$	$1.4.10^{-10}$	$8.9.10^{-11}$	$5.5.10^{-11}$	$4.5.10^{-11}$
	M	1.0	$7.3.10^{-10}$	1.0	$5.0.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$	$1.2.10^{-10}$	$9.5.10^{-11}$
arsenic									
As-69	M	1.0	$2.1.10^{-10}$	0.5	$1.4.10^{-10}$	$6.3.10^{-11}$	$4.0.10^{-11}$	$2.5.10^{-11}$	$2.1.10^{-11}$
As-70	M	1.0	$5.7.10^{-10}$	0.5	$4.3.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$8.3.10^{-11}$	$6.7.10^{-11}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
As-71	M	1.0	$2.2.10^{-9}$	0.5	$1.9.10^{-9}$	$1.0.10^{-9}$	$6.8.10^{-10}$	$5.0.10^{-10}$	$4.0.10^{-10}$
As-72	M	1.0	$5.9.10^{-9}$	0.5	$5.7.10^{-9}$	$2.7.10^{-9}$	$1.7.10^{-9}$	$1.1.10^{-9}$	$9.0.10^{-10}$
As-73	M	1.0	$5.4.10^{-9}$	0.5	$4.0.10^{-9}$	$2.3.10^{-9}$	$1.5.10^{-9}$	$1.2.10^{-9}$	$1.0.10^{-9}$
As-74	M	1.0	$1.1.10^{-8}$	0.5	$8.4.10^{-9}$	$4.7.10^{-9}$	$3.3.10^{-9}$	$2.6.10^{-9}$	$2.1.10^{-9}$
As-76	M	1.0	$5.1.10^{-9}$	0.5	$4.6.10^{-9}$	$2.2.10^{-9}$	$1.4.10^{-9}$	$8.8.10^{-10}$	$7.4.10^{-10}$
As-77	M	1.0	$2.2.10^{-9}$	0.5	$1.7.10^{-9}$	$8.9.10^{-10}$	$6.2.10^{-10}$	$5.0.10^{-10}$	$3.9.10^{-10}$
As-78	M	1.0	$8.0.10^{-10}$	0.5	$5.8.10^{-10}$	$2.7.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$8.9.10^{-11}$
selenium									
Se-70	F	1.0	$3.9.10^{-10}$	0.8	$3.0.10^{-10}$	$1.5.10^{-10}$	$9.0.10^{-11}$	$5.1.10^{-11}$	$4.2.10^{-11}$
	M	0.2	$6.5.10^{-10}$	0.1	$4.7.10^{-10}$	$2.3.10^{-10}$	$1.4.10^{-10}$	$8.9.10^{-11}$	$7.3.10^{-11}$
	S	0.02	$6.8.10^{-10}$	0.01	$4.8.10^{-10}$	$2.3.10^{-10}$	$1.5.10^{-10}$	$9.4.10^{-11}$	$7.6.10^{-11}$
Se-73	F	1.0	$7.7.10^{-10}$	0.8	$6.5.10^{-10}$	$3.3.10^{-10}$	$2.1.10^{-10}$	$1.0.10^{-10}$	$8.0.10^{-11}$
	M	0.2	$1.6.10^{-9}$	0.1	$1.2.10^{-9}$	$5.9.10^{-10}$	$3.8.10^{-10}$	$2.4.10^{-10}$	$1.9.10^{-10}$
	S	0.02	$1.8.10^{-9}$	0.01	$1.3.10^{-9}$	$6.3.10^{-10}$	$4.0.10^{-10}$	$2.6.10^{-10}$	$2.1.10^{-10}$
Se-73m	F	1.0	$9.3.10^{-11}$	0.8	$7.2.10^{-11}$	$3.5.10^{-11}$	$2.3.10^{-11}$	$1.1.10^{-11}$	$9.2.10^{-12}$
	M	0.2	$1.8.10^{-10}$	0.1	$1.3.10^{-10}$	$6.1.10^{-11}$	$3.9.10^{-11}$	$2.5.10^{-11}$	$2.0.10^{-11}$
	S	0.02	$1.9.10^{-10}$	0.01	$1.3.10^{-10}$	$6.5.10^{-11}$	$4.1.10^{-11}$	$2.6.10^{-11}$	$2.2.10^{-11}$
Se-75	F	1.0	$7.8.10^{-9}$	0.8	$6.0.10^{-9}$	$3.4.10^{-9}$	$2.5.10^{-9}$	$1.2.10^{-9}$	$1.0.10^{-9}$
	M	0.2	$5.4.10^{-9}$	0.1	$4.5.10^{-9}$	$2.5.10^{-9}$	$1.7.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$
	S	0.02	$5.6.10^{-9}$	0.01	$4.7.10^{-9}$	$2.9.10^{-9}$	$2.0.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
Se-79	F	1.0	$1.6.10^{-8}$	0.8	$1.3.10^{-8}$	$7.7.10^{-9}$	$5.6.10^{-9}$	$1.5.10^{-9}$	$1.1.10^{-9}$
	M	0.2	$1.4.10^{-8}$	0.1	$1.1.10^{-8}$	$6.9.10^{-9}$	$4.9.10^{-9}$	$3.3.10^{-9}$	$2.6.10^{-9}$
	S	0.02	$2.3.10^{-8}$	0.01	$2.0.10^{-8}$	$1.3.10^{-8}$	$8.7.10^{-9}$	$7.6.10^{-9}$	$6.8.10^{-9}$
Se-81	F	1.0	$8.6.10^{-11}$	0.8	$5.4.10^{-11}$	$2.3.10^{-11}$	$1.5.10^{-11}$	$9.2.10^{-12}$	$8.0.10^{-12}$
	M	0.2	$1.3.10^{-10}$	0.1	$8.5.10^{-11}$	$3.8.10^{-11}$	$2.5.10^{-11}$	$1.6.10^{-11}$	$1.4.10^{-11}$
	S	0.02	$1.4.10^{-10}$	0.01	$8.9.10^{-11}$	$3.9.10^{-11}$	$2.6.10^{-11}$	$1.7.10^{-11}$	$1.5.10^{-11}$
Se-81m	F	1.0	$1.8.10^{-10}$	0.8	$1.2.10^{-10}$	$5.4.10^{-11}$	$3.4.10^{-11}$	$1.9.10^{-11}$	$1.6.10^{-11}$
	M	0.2	$3.8.10^{-10}$	0.1	$2.5.10^{-10}$	$1.2.10^{-10}$	$8.0.10^{-11}$	$5.8.10^{-11}$	$4.7.10^{-11}$
	S	0.02	$4.1.10^{-10}$	0.01	$2.7.10^{-10}$	$1.3.10^{-10}$	$8.5.10^{-11}$	$6.2.10^{-11}$	$5.1.10^{-11}$
Se-83	F	1.0	$1.7.10^{-10}$	0.8	$1.2.10^{-10}$	$5.8.10^{-11}$	$3.6.10^{-11}$	$2.1.10^{-11}$	$1.8.10^{-11}$
	M	0.2	$2.7.10^{-10}$	0.1	$1.9.10^{-10}$	$9.2.10^{-11}$	$5.9.10^{-11}$	$3.9.10^{-11}$	$3.2.10^{-11}$
	S	0.02	$2.8.10^{-10}$	0.01	$2.0.10^{-10}$	$9.6.10^{-11}$	$6.2.10^{-11}$	$4.1.10^{-11}$	$3.4.10^{-11}$
bromine									
Br-74	F	1.0	$2.5.10^{-10}$	1.0	$1.8.10^{-10}$	$8.6.10^{-11}$	$5.3.10^{-11}$	$3.2.10^{-11}$	$2.6.10^{-11}$
	M	1.0	$3.6.10^{-10}$	1.0	$2.5.10^{-10}$	$1.2.10^{-10}$	$7.5.10^{-11}$	$4.6.10^{-11}$	$3.8.10^{-11}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
Br-74m	F	1.0	$4.0.10^{-10}$	1.0	$2.8.10^{-10}$	$1.3.10^{-10}$	$8.1.10^{-11}$	$4.8.10^{-11}$	$3.9.10^{-11}$
	M	1.0	$5.9.10^{-10}$	1.0	$4.1.10^{-10}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$7.5.10^{-11}$	$6.2.10^{-11}$
Br-75	F	1.0	$2.9.10^{-10}$	1.0	$2.1.10^{-10}$	$9.7.10^{-11}$	$5.9.10^{-11}$	$3.5.10^{-11}$	$2.9.10^{-11}$
	M	1.0	$4.5.10^{-10}$	1.0	$3.1.10^{-10}$	$1.5.10^{-10}$	$9.7.10^{-11}$	$6.5.10^{-11}$	$5.3.10^{-11}$
Br-76	F	1.0	$2.2.10^{-9}$	1.0	$1.7.10^{-9}$	$8.4.10^{-10}$	$5.1.10^{-10}$	$3.0.10^{-10}$	$2.4.10^{-10}$
	M	1.0	$3.0.10^{-9}$	1.0	$2.3.10^{-9}$	$1.2.10^{-9}$	$7.5.10^{-10}$	$5.0.10^{-10}$	$4.1.10^{-10}$
Br-77	F	1.0	$5.3.10^{-10}$	1.0	$4.4.10^{-10}$	$2.2.10^{-10}$	$1.3.10^{-10}$	$7.7.10^{-11}$	$6.2.10^{-11}$
	M	1.0	$6.3.10^{-10}$	1.0	$5.1.10^{-10}$	$2.7.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$8.4.10^{-11}$
Br-80	F	1.0	$7.1.10^{-11}$	1.0	$4.4.10^{-11}$	$1.8.10^{-11}$	$1.2.10^{-11}$	$6.9.10^{-12}$	$5.9.10^{-12}$
	M	1.0	$1.1.10^{-10}$	1.0	$6.5.10^{-11}$	$2.8.10^{-11}$	$1.8.10^{-11}$	$1.1.10^{-11}$	$9.4.10^{-12}$
Br-80m	F	1.0	$4.3.10^{-10}$	1.0	$2.8.10^{-10}$	$1.2.10^{-10}$	$7.2.10^{-11}$	$4.0.10^{-11}$	$3.3.10^{-11}$
	M	1.0	$6.8.10^{-10}$	1.0	$4.5.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$9.3.10^{-11}$	$7.6.10^{-11}$
Br-82	F	1.0	$2.7.10^{-9}$	1.0	$2.2.10^{-9}$	$1.2.10^{-9}$	$7.0.10^{-10}$	$4.2.10^{-10}$	$3.5.10^{-10}$
	M	1.0	$3.8.10^{-9}$	1.0	$3.0.10^{-9}$	$1.7.10^{-9}$	$1.1.10^{-9}$	$7.9.10^{-10}$	$6.3.10^{-10}$
Br-83	F	1.0	$1.7.10^{-10}$	1.0	$1.1.10^{-10}$	$4.7.10^{-11}$	$3.0.10^{-11}$	$1.8.10^{-11}$	$1.6.10^{-11}$
	M	1.0	$3.5.10^{-10}$	1.0	$2.3.10^{-10}$	$1.1.10^{-10}$	$7.7.10^{-11}$	$5.9.10^{-11}$	$4.8.10^{-11}$
Br-84	F	1.0	$2.4.10^{-10}$	1.0	$1.6.10^{-10}$	$7.1.10^{-11}$	$4.4.10^{-11}$	$2.6.10^{-11}$	$2.2.10^{-11}$
	M	1.0	$3.7.10^{-10}$	1.0	$2.4.10^{-10}$	$1.1.10^{-10}$	$6.9.10^{-11}$	$4.4.10^{-11}$	$3.7.10^{-11}$
rubidium									
Rb-79	F	1.0	$1.6.10^{-10}$	1.0	$1.1.10^{-10}$	$5.0.10^{-11}$	$3.2.10^{-11}$	$1.9.10^{-11}$	$1.6.10^{-11}$
Rb-81	F	1.0	$3.2.10^{-10}$	1.0	$2.5.10^{-10}$	$1.2.10^{-10}$	$7.1.10^{-11}$	$4.2.10^{-11}$	$3.4.10^{-11}$
Rb-81m	F	1.0	$6.2.10^{-11}$	1.0	$4.6.10^{-11}$	$2.2.10^{-11}$	$1.4.10^{-11}$	$8.5.10^{-12}$	$7.0.10^{-12}$
Rb-82m	F	1.0	$8.6.10^{-10}$	1.0	$7.3.10^{-10}$	$3.9.10^{-10}$	$2.3.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
Rb-83	F	1.0	$4.9.10^{-9}$	1.0	$3.8.10^{-9}$	$2.0.10^{-9}$	$1.3.10^{-9}$	$7.9.10^{-10}$	$6.9.10^{-10}$
Rb-84	F	1.0	$8.6.10^{-9}$	1.0	$6.4.10^{-9}$	$3.1.10^{-9}$	$2.0.10^{-9}$	$1.2.10^{-9}$	$1.0.10^{-9}$
Rb-86	F	1.0	$1.2.10^{-8}$	1.0	$7.7.10^{-9}$	$3.4.10^{-9}$	$2.0.10^{-9}$	$1.1.10^{-9}$	$9.3.10^{-10}$
Rb-87	F	1.0	$6.0.10^{-9}$	1.0	$4.1.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$6.0.10^{-10}$	$5.0.10^{-10}$
Rb-88	F	1.0	$1.9.10^{-10}$	1.0	$1.2.10^{-10}$	$5.2.10^{-11}$	$3.2.10^{-11}$	$1.9.10^{-11}$	$1.6.10^{-11}$
Rb-89	F	1.0	$1.4.10^{-10}$	1.0	$9.3.10^{-11}$	$4.3.10^{-11}$	$2.7.10^{-11}$	$1.6.10^{-11}$	$1.4.10^{-11}$
strontium									
Sr-80	F	0.6	$7.8.10^{-10}$	0.4^{X}	$5.4.10^{-10}$	$2.4.10^{-10}$	$1.4.10^{-10}$	$7.9.10^{-11}$	$7.1.10^{-11}$
	M	0.2	$1.4.10^{-9}$	0.1	$9.0.10^{-10}$	$4.1.10^{-10}$	$2.5.10^{-10}$	$1.5.10^{-10}$	$1.3.10^{-10}$
	S	0.02	$1.5.10^{-9}$	0.01	$9.4.10^{-10}$	$4.3.10^{-10}$	$2.7.10^{-10}$	$1.6.10^{-10}$	$1.4.10^{-10}$
Sr-81	F	0.6	$2.1.10^{-10}$	0.4^{X}	$1.5.10^{-10}$	$6.7.10^{-11}$	$4.1.10^{-11}$	$2.4.10^{-11}$	$2.1.10^{-11}$
	M	0.2	$3.3.10^{-10}$	0.1	$2.2.10^{-10}$	$1.0.10^{-10}$	$6.6.10^{-11}$	$4.2.10^{-11}$	$3.5.10^{-11}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
	S	0.02	$3.4.10^{-10}$	0.01	$2.3.10^{-10}$	$1.1.10^{-10}$	$6.9.10^{-11}$	$4.4.10^{-11}$	$3.7.10^{-11}$
Sr-82	F	0.6	$2.8.10^{-8}$	0.4^{X}	$1.5.10^{-8}$	$6.6.10^{-9}$	$4.6.10^{-9}$	$3.2.10^{-9}$	$2.1.10^{-9}$
	M	0.2	$5.5.10^{-8}$	0.1	$4.0.10^{-8}$	$2.1.10^{-8}$	$1.4.10^{-8}$	$1.0.10^{-8}$	$8.9.10^{-9}$
	S	0.02	$6.1.10^{-8}$	0.01	$4.6.10^{-8}$	$2.5.10^{-8}$	$1.7.10^{-8}$	$1.2.10^{-8}$	$1.1.10^{-8}$
Sr-83	F	0.6	$1.4.10^{-9}$	0.4^{X}	$1.1.10^{-9}$	$5.5.10^{-10}$	$3.4.10^{-10}$	$2.0.10^{-10}$	$1.6.10^{-10}$
	M	0.2	$2.5.10^{-9}$	0.1	$1.9.10^{-9}$	$9.5.10^{-10}$	$6.0.10^{-10}$	$3.9.10^{-10}$	$3.1.10^{-10}$
	S	0.02	$2.8.10^{-9}$	0.01	$2.0.10^{-9}$	$1.0.10^{-9}$	$6.5.10^{-10}$	$4.2.10^{-10}$	$3.4.10^{-10}$
Sr-85	F	0.6	$4.4.10^{-9}$	0.4^{X}	$2.3.10^{-9}$	$1.1.10^{-9}$	$9.6.10^{-10}$	$8.3.10^{-10}$	$3.8.10^{-10}$
	M	0.2	$4.3.10^{-9}$	0.1	$3.1.10^{-9}$	$1.8.10^{-9}$	$1.2.10^{-9}$	$8.8.10^{-10}$	$6.4.10^{-10}$
	S	0.02	$4.4.10^{-9}$	0.01	$3.7.10^{-9}$	$2.2.10^{-9}$	$1.3.10^{-9}$	$1.0.10^{-9}$	$8.1.10^{-10}$
Sr-85m	F	0.6	$2.4.10^{-11}$	0.4^{X}	$1.9.10^{-11}$	$9.6.10^{-12}$	$6.0.10^{-12}$	$3.7.10^{-12}$	$2.9.10^{-12}$
	M	0.2	$3.1.10^{-11}$	0.1	$2.5.10^{-11}$	$1.3.10^{-11}$	$8.0.10^{-12}$	$5.1.10^{-12}$	$4.1.10^{-12}$
	S	0.02	$3.2.10^{-11}$	0.01	$2.6.10^{-11}$	$1.3.10^{-11}$	$8.3.10^{-12}$	$5.4.10^{-12}$	$4.3.10^{-12}$
Sr-87m	F	0.6	$9.7.10^{-11}$	0.4^{X}	$7.8.10^{-11}$	$3.8.10^{-11}$	$2.3.10^{-11}$	$1.3.10^{-11}$	$1.1.10^{-11}$
	M	0.2	$1.6.10^{-10}$	0.1	$1.2.10^{-10}$	$5.9.10^{-11}$	$3.8.10^{-11}$	$2.5.10^{-11}$	$2.0.10^{-11}$
	S	0.02	$1.7.10^{-10}$	0.01	$1.2.10^{-10}$	$6.2.10^{-11}$	$4.0.10^{-11}$	$2.6.10^{-11}$	$2.1.10^{-11}$
Sr-89	F	0.6	$1.5.10^{-8}$	0.4^{X}	$7.3.10^{-9}$	$3.2.10^{-9}$	$2.3.10^{-9}$	$1.7.10^{-9}$	$1.0.10^{-9}$
	M	0.2	$3.3.10^{-8}$	0.1	$2.4.10^{-8}$	$1.3.10^{-8}$	$9.1.10^{-9}$	$7.3.10^{-9}$	$6.1.10^{-9}$
	S	0.02	$3.9.10^{-8}$	0.01	$3.0.10^{-8}$	$1.7.10^{-8}$	$1.2.10^{-8}$	$9.3.10^{-9}$	$7.9.10^{-9}$
Sr-90	F	0.6	$1.3.10^{-7}$	0.4^{X}	$5.2.10^{-8}$	$3.1.10^{-8}$	$4.1.10^{-8}$	$5.3.10^{-8}$	$2.4.10^{-8}$
	M	0.2	$1.5.10^{-7}$	0.1	$1.1.10^{-7}$	$6.5.10^{-8}$	$5.1.10^{-8}$	$5.0.10^{-8}$	$3.6.10^{-8}$
	S	0.02	$4.2.10^{-7}$	0.01	$4.0.10^{-7}$	$2.7.10^{-7}$	$1.8.10^{-7}$	$1.6.10^{-7}$	$1.6.10^{-7}$
Sr-91	F	0.6	$1.4.10^{-9}$	0.4^{X}	$1.1.10^{-9}$	$5.2.10^{-10}$	$3.1.10^{-10}$	$1.7.10^{-10}$	$1.6.10^{-10}$
	M	0.2	$3.1.10^{-9}$	0.1	$2.2.10^{-9}$	$1.1.10^{-9}$	$6.9.10^{-10}$	$4.4.10^{-10}$	$3.7.10^{-10}$
	S	0.02	$3.5.10^{-9}$	0.01	$2.5.10^{-9}$	$1.2.10^{-9}$	$7.7.10^{-10}$	$4.9.10^{-10}$	$4.1.10^{-10}$
Sr-92	F	0.6	$9.0.10^{-10}$	0.4^{X}	$7.1.10^{-10}$	$3.3.10^{-10}$	$2.0.10^{-10}$	$1.0.10^{-10}$	$9.8.10^{-11}$
	M	0.2	$1.9.10^{-9}$	0.1	$1.4.10^{-9}$	$6.5.10^{-10}$	$4.1.10^{-10}$	$2.5.10^{-10}$	$2.1.10^{-10}$
	S	0.02	$2.2.10^{-9}$	0.01	$1.5.10^{-9}$	$7.0.10^{-10}$	$4.5.10^{-10}$	$2.7.10^{-10}$	$2.3.10^{-10}$
yttrium									
Y-86	M	0.001	$3.7.10^{-9}$	$1.0.10^{-4}$	$2.9.10^{-9}$	$1.5.10^{-9}$	$9.3.10^{-10}$	$5.6.10^{-10}$	$4.5.10^{-10}$
	S	0.001	$3.8.10^{-9}$	$1.0.10^{-4}$	$3.0.10^{-9}$	$1.5.10^{-9}$	$9.6.10^{-10}$	$5.8.10^{-10}$	$4.7.10^{-10}$
Y-86m	M	0.001	$2.2.10^{-10}$	$1.0.10^{-4}$	$1.7.10^{-10}$	$8.7.10^{-11}$	$5.6.10^{-11}$	$3.4.10^{-11}$	$2.7.10^{-11}$
	S	0.001	$2.3.10^{-10}$	$1.0.10^{-4}$	$1.8.10^{-10}$	$9.0.10^{-11}$	$5.7.10^{-11}$	$3.5.10^{-11}$	$2.8.10^{-11}$
Y-87	M	0.001	$2.7.10^{-9}$	$1.0.10^{-4}$	$2.1.10^{-9}$	$1.1.10^{-9}$	$7.0.10^{-10}$	$4.7.10^{-10}$	$3.7.10^{-10}$
	S	0.001	$2.8.10^{-9}$	$1.0.10^{-4}$	$2.2.10^{-9}$	$1.1.10^{-9}$	$7.3.10^{-10}$	$5.0.10^{-10}$	$3.9.10^{-10}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Y-88	M	0.001	$1.9.10^{-8}$	$1.0.10^{-4}$	$1.6.10^{-8}$	$1.0.10^{-8}$	$6.7.10^{-9}$	$4.9.10^{-9}$	$4.1.10^{-9}$
	S	0.001	$2.0.10^{-8}$	$1.0.10^{-4}$	$1.7.10^{-8}$	$9.8.10^{-9}$	$6.6.10^{-9}$	$5.4.10^{-9}$	$4.4.10^{-9}$
Y-90	M	0.001	$1.3.10^{-8}$	$1.0.10^{-4}$	$8.4.10^{-9}$	$4.0.10^{-9}$	$2.6.10^{-9}$	$1.7.10^{-9}$	$1.4.10^{-9}$
	S	0.001	$1.3.10^{-8}$	$1.0.10^{-4}$	$8.8.10^{-9}$	$4.2.10^{-9}$	$2.7.10^{-9}$	$1.8.10^{-9}$	$1.5.10^{-9}$
Y-90m	M	0.001	$7.2.10^{-10}$	$1.0.10^{-4}$	$5.7.10^{-10}$	$2.8.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$9.5.10^{-11}$
	S	0.001	$7.5.10^{-10}$	$1.0.10^{-4}$	$6.0.10^{-10}$	$2.9.10^{-10}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$1.0.10^{-10}$
Y-91	M	0.001	$3.9.10^{-8}$	$1.0.10^{-4}$	$3.0.10^{-8}$	$1.6.10^{-8}$	$1.1.10^{-8}$	$8.4.10^{-9}$	$7.1.10^{-9}$
	S	0.001	$4.3.10^{-8}$	$1.0.10^{-4}$	$3.4.10^{-8}$	$1.9.10^{-8}$	$1.3.10^{-8}$	$1.0.10^{-8}$	$8.9.10^{-9}$
Y-91m	M	0.001	$7.0.10^{-11}$	$1.0.10^{-4}$	$5.5.10^{-11}$	$2.9.10^{-11}$	$1.8.10^{-11}$	$1.2.10^{-11}$	$1.0.10^{-11}$
	S	0.001	$7.4.10^{-11}$	$1.0.10^{-4}$	$5.9.10^{-11}$	$3.1.10^{-11}$	$2.0.10^{-11}$	$1.4.10^{-11}$	$1.1.10^{-11}$
Y-92	M	0.001	$1.8.10^{-9}$	$1.0.10^{-4}$	$1.2.10^{-9}$	$5.3.10^{-10}$	$3.3.10^{-10}$	$2.0.10^{-10}$	$1.7.10^{-10}$
	S	0.001	$1.9.10^{-9}$	$1.0.10^{-4}$	$1.2.10^{-9}$	$5.5.10^{-10}$	$3.5.10^{-10}$	$2.1.10^{-10}$	$1.8.10^{-10}$
Y-93	M	0.001	$4.4.10^{-9}$	$1.0.10^{-4}$	$2.9.10^{-9}$	$1.3.10^{-9}$	$8.1.10^{-10}$	$4.7.10^{-10}$	$4.0.10^{-10}$
	S	0.001	$4.6.10^{-9}$	$1.0.10^{-4}$	$3.0.10^{-9}$	$1.4.10^{-9}$	$8.5.10^{-10}$	$5.0.10^{-10}$	$4.2.10^{-10}$
Y-94	M	0.001	$2.8.10^{-10}$	$1.0.10^{-4}$	$1.8.10^{-10}$	$8.1.10^{-11}$	$5.0.10^{-11}$	$3.1.10^{-11}$	$2.7.10^{-11}$
	S	0.001	$2.9.10^{-10}$	$1.0.10^{-4}$	$1.9.10^{-10}$	$8.4.10^{-11}$	$5.2.10^{-11}$	$3.3.10^{-11}$	$2.8.10^{-11}$
Y-95	M	0.001	$1.5.10^{-10}$	$1.0.10^{-4}$	$9.8.10^{-11}$	$4.4.10^{-11}$	$2.8.10^{-11}$	$1.8.10^{-11}$	$1.5.10^{-11}$
	S	0.001	$1.6.10^{-10}$	$1.0.10^{-4}$	$1.0.10^{-10}$	$4.5.10^{-11}$	$2.9.10^{-11}$	$1.8.10^{-11}$	$1.6.10^{-11}$
zirconium									
Zr-86	F	0.02	$2.4.10^{-9}$	0.002	$1.9.10^{-9}$	$9.5.10^{-10}$	$5.9.10^{-10}$	$3.4.10^{-10}$	$2.7.10^{-10}$
	M	0.02	$3.4.10^{-9}$	0.002	$2.6.10^{-9}$	$1.3.10^{-9}$	$8.4.10^{-10}$	$5.2.10^{-10}$	$4.2.10^{-10}$
	S	0.02	$3.5.10^{-9}$	0.002	$2.7.10^{-9}$	$1.4.10^{-9}$	$8.7.10^{-10}$	$5.4.10^{-10}$	$4.3.10^{-10}$
Zr-88	F	0.02	$6.9.10^{-9}$	0.002	$8.3.10^{-9}$	$5.6.10^{-9}$	$4.7.10^{-9}$	$3.6.10^{-9}$	$3.5.10^{-9}$
	M	0.02	$8.5.10^{-9}$	0.002	$7.8.10^{-9}$	$5.1.10^{-9}$	$3.6.10^{-9}$	$3.0.10^{-9}$	$2.6.10^{-9}$
	S	0.02	$1.3.10^{-8}$	0.002	$1.2.10^{-8}$	$7.7.10^{-9}$	$5.2.10^{-9}$	$4.3.10^{-9}$	$3.6.10^{-9}$
Zr-89	F	0.02	$2.6.10^{-9}$	0.002	$2.0.10^{-9}$	$9.9.10^{-10}$	$6.1.10^{-10}$	$3.6.10^{-10}$	$2.9.10^{-10}$
	M	0.02	$3.7.10^{-9}$	0.002	$2.8.10^{-9}$	$1.5.10^{-9}$	$9.6.10^{-10}$	$6.5.10^{-10}$	$5.2.10^{-10}$
	S	0.02	$3.9.10^{-9}$	0.002	$2.9.10^{-9}$	$1.5.10^{-9}$	$1.0.10^{-9}$	$6.8.10^{-10}$	$5.5.10^{-10}$
Zr-93	F	0.02	$3.5.10^{-9}$	0.002	$4.8.10^{-9}$	$5.3.10^{-9}$	$9.7.10^{-9}$	$1.8.10^{-8}$	$2.5.10^{-8}$
	M	0.02	$3.3.10^{-9}$	0.002	$3.1.10^{-9}$	$2.8.10^{-9}$	$4.1.10^{-9}$	$7.5.10^{-9}$	$1.0.10^{-8}$
	S	0.02	$7.0.10^{-9}$	0.002	$6.4.10^{-9}$	$4.5.10^{-9}$	$3.3.10^{-9}$	$3.3.10^{-9}$	$3.3.10^{-9}$
Zr-95	F	0.02	$1.2.10^{-8}$	0.002	$1.1.10^{-8}$	$6.4.10^{-9}$	$4.2.10^{-9}$	$2.8.10^{-9}$	$2.5.10^{-9}$
	M	0.02	$2.0.10^{-8}$	0.002	$1.6.10^{-8}$	$9.7.10^{-9}$	$6.8.10^{-9}$	$5.9.10^{-9}$	$4.8.10^{-9}$
	S	0.02	$2.4.10^{-8}$	0.002	$1.9.10^{-8}$	$1.2.10^{-8}$	$8.3.10^{-9}$	$7.3.10^{-9}$	$5.9.10^{-9}$
Zr-97	F	0.02	$5.0.10^{-9}$	0.002	$3.4.10^{-9}$	$1.5.10^{-9}$	$9.1.10^{-10}$	$4.8.10^{-10}$	$3.9.10^{-10}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
	M	0.02	$7.8.10^{-9}$	0.002	$5.3.10^{-9}$	$2.8.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$9.2.10^{-10}$
	S	0.02	$8.2.10^{-9}$	0.002	$5.6.10^{-9}$	$2.9.10^{-9}$	$1.9.10^{-9}$	$1.2.10^{-9}$	$8.9.10^{-10}$
niobium									
Nb-88	F	0.02	$1.8.10^{-10}$	0.01	$1.3.10^{-10}$	$6.3.10^{-11}$	$3.9.10^{-11}$	$2.4.10^{-11}$	$1.9.10^{-11}$
	M	0.02	$2.5.10^{-10}$	0.01	$1.8.10^{-10}$	$8.5.10^{-11}$	$5.3.10^{-11}$	$3.3.10^{-11}$	$2.7.10^{-11}$
	S	0.02	$2.6.10^{-10}$	0.01	$1.8.10^{-10}$	$8.7.10^{-11}$	$5.5.10^{-11}$	$3.5.10^{-11}$	$2.8.10^{-11}$
Nb-89	F	0.02	$7.0.10^{-10}$	0.01	$4.8.10^{-10}$	$2.2.10^{-10}$	$1.3.10^{-10}$	$7.4.10^{-11}$	$6.1.10^{-11}$
	M	0.02	$1.1.10^{-9}$	0.01	$7.6.10^{-10}$	$3.6.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
	S	0.02	$1.2.10^{-9}$	0.01	$7.9.10^{-10}$	$3.7.10^{-10}$	$2.3.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
Nb-89m	F	0.02	$4.0.10^{-10}$	0.01	$2.9.10^{-10}$	$1.4.10^{-10}$	$8.3.10^{-11}$	$4.8.10^{-11}$	$3.9.10^{-11}$
	M	0.02	$6.2.10^{-10}$	0.01	$4.3.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$8.2.10^{-11}$	$6.8.10^{-11}$
	S	0.02	$6.4.10^{-10}$	0.01	$4.4.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$8.6.10^{-11}$	$7.1.10^{-11}$
Nb-90	F	0.02	$3.5.10^{-9}$	0.01	$2.7.10^{-9}$	$1.3.10^{-9}$	$8.2.10^{-10}$	$4.7.10^{-10}$	$3.8.10^{-10}$
	M	0.02	$5.1.10^{-9}$	0.01	$3.9.10^{-9}$	$1.9.10^{-9}$	$1.3.10^{-9}$	$7.8.10^{-10}$	$6.3.10^{-10}$
	S	0.02	$5.3.10^{-9}$	0.01	$4.0.10^{-9}$	$2.0.10^{-9}$	$1.3.10^{-9}$	$8.1.10^{-10}$	$6.6.10^{-10}$
Nb-93m	F	0.02	$1.8.10^{-9}$	0.01	$1.4.10^{-9}$	$7.0.10^{-10}$	$4.4.10^{-10}$	$2.7.10^{-10}$	$2.2.10^{-10}$
	M	0.02	$3.1.10^{-9}$	0.01	$2.4.10^{-9}$	$1.3.10^{-9}$	$8.2.10^{-10}$	$5.9.10^{-10}$	$5.1.10^{-10}$
	S	0.02	$7.4.10^{-9}$	0.01	$6.5.10^{-9}$	$4.0.10^{-9}$	$2.5.10^{-9}$	$1.9.10^{-9}$	$1.8.10^{-9}$
Nb-94	F	0.02	$3.1.10^{-8}$	0.01	$2.7.10^{-8}$	$1.5.10^{-8}$	$1.0.10^{-8}$	$6.7.10^{-9}$	$5.8.10^{-9}$
	M	0.02	$4.3.10^{-8}$	0.01	$3.7.10^{-8}$	$2.3.10^{-8}$	$1.6.10^{-8}$	$1.3.10^{-8}$	$1.1.10^{-8}$
	S	0.02	$1.2.10^{-7}$	0.01	$1.2.10^{-7}$	$8.3.10^{-8}$	$5.8.10^{-8}$	$5.2.10^{-8}$	$4.9.10^{-8}$
Nb-95	F	0.02	$4.1.10^{-9}$	0.01	$3.1.10^{-9}$	$1.6.10^{-9}$	$1.2.10^{-9}$	$7.5.10^{-10}$	$5.7.10^{-10}$
	M	0.02	$6.8.10^{-9}$	0.01	$5.2.10^{-9}$	$3.1.10^{-9}$	$2.2.10^{-9}$	$1.9.10^{-9}$	$1.5.10^{-9}$
	S	0.02	$7.7.10^{-9}$	0.01	$5.9.10^{-9}$	$3.6.10^{-9}$	$2.5.10^{-9}$	$2.2.10^{-9}$	$1.8.10^{-9}$
Nb-95m	F	0.02	$2.3.10^{-9}$	0.01	$1.6.10^{-9}$	$7.0.10^{-10}$	$4.2.10^{-10}$	$2.4.10^{-10}$	$2.0.10^{-10}$
	M	0.02	$4.3.10^{-9}$	0.01	$3.1.10^{-9}$	$1.7.10^{-9}$	$1.2.10^{-9}$	$1.0.10^{-9}$	$7.9.10^{-10}$
	S	0.02	$4.6.10^{-9}$	0.01	$3.4.10^{-9}$	$1.9.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$	$8.8.10^{-10}$
Nb-96	F	0.02	$3.1.10^{-9}$	0.01	$2.4.10^{-9}$	$1.2.10^{-9}$	$7.3.10^{-10}$	$4.2.10^{-10}$	$3.4.10^{-10}$
	M	0.02	$4.7.10^{-9}$	0.01	$3.6.10^{-9}$	$1.8.10^{-9}$	$1.2.10^{-9}$	$7.8.10^{-10}$	$6.3.10^{-10}$
	S	0.02	$4.9.10^{-9}$	0.01	$3.7.10^{-9}$	$1.9.10^{-9}$	$1.2.10^{-9}$	$8.3.10^{-10}$	$6.6.10^{-10}$
Nb-97	F	0.02	$2.2.10^{-10}$	0.01	$1.5.10^{-10}$	$6.8.10^{-11}$	$4.2.10^{-11}$	$2.5.10^{-11}$	$2.1.10^{-11}$
	M	0.02	$3.7.10^{-10}$	0.01	$2.5.10^{-10}$	$1.2.10^{-10}$	$7.7.10^{-11}$	$5.2.10^{-11}$	$4.3.10^{-11}$
	S	0.02	$3.8.10^{-10}$	0.01	$2.6.10^{-10}$	$1.2.10^{-10}$	$8.1.10^{-11}$	$5.5.10^{-11}$	$4.5.10^{-11}$
Nb-98m	F	0.02	$3.4.10^{-10}$	0.01	$2.4.10^{-10}$	$1.1.10^{-10}$	$6.9.10^{-11}$	$4.1.10^{-11}$	$3.3.10^{-11}$
	M	0.02	$5.2.10^{-10}$	0.01	$3.6.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$6.8.10^{-11}$	$5.6.10^{-11}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
	S	0.02	$5.3.10^{-10}$	0.01	$3.7.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$7.1.10^{-11}$	$5.8.10^{-11}$
molybdenum									
Mo-90	F	1.0	$1.2.10^{-9}$	0.8	$1.1.10^{-9}$	$5.3.10^{-10}$	$3.2.10^{-10}$	$1.9.10^{-10}$	$1.5.10^{-10}$
	M	0.2	$2.6.10^{-9}$	0.1	$2.0.10^{-9}$	$9.9.10^{-10}$	$6.5.10^{-10}$	$4.2.10^{-10}$	$3.4.10^{-10}$
	S	0.02	$2.8.10^{-9}$	0.01	$2.1.10^{-9}$	$1.1.10^{-9}$	$6.9.10^{-10}$	$4.5.10^{-10}$	$3.6.10^{-10}$
Mo-93	F	1.0	$3.1.10^{-9}$	0.8	$2.6.10^{-9}$	$1.7.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$	$1.0.10^{-9}$
	M	0.2	$2.2.10^{-9}$	0.1	$1.8.10^{-9}$	$1.1.10^{-9}$	$7.9.10^{-10}$	$6.6.10^{-10}$	$5.9.10^{-10}$
	S	0.02	$6.0.10^{-9}$	0.01	$5.8.10^{-9}$	$4.0.10^{-9}$	$2.8.10^{-9}$	$2.4.10^{-9}$	$2.3.10^{-9}$
Mo-93m	F	1.0	$7.3.10^{-10}$	0.8	$6.4.10^{-10}$	$3.3.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$9.6.10^{-11}$
	M	0.2	$1.2.10^{-9}$	0.1	$9.7.10^{-10}$	$5.0.10^{-10}$	$3.2.10^{-10}$	$2.0.10^{-10}$	$1.6.10^{-10}$
	S	0.02	$1.3.10^{-9}$	0.01	$1.0.10^{-9}$	$5.2.10^{-10}$	$3.4.10^{-10}$	$2.1.10^{-10}$	$1.7.10^{-10}$
Mo-99	F	1.0	$2.3.10^{-9}$	0.8	$1.7.10^{-9}$	$7.7.10^{-10}$	$4.7.10^{-10}$	$2.6.10^{-10}$	$2.2.10^{-10}$
	M	0.2	$6.0.10^{-9}$	0.1	$4.4.10^{-9}$	$2.2.10^{-9}$	$1.5.10^{-9}$	$1.1.10^{-9}$	$8.9.10^{-10}$
	S	0.02	$6.9.10^{-9}$	0.01	$4.8.10^{-9}$	$2.4.10^{-9}$	$1.7.10^{-9}$	$1.2.10^{-9}$	$9.9.10^{-10}$
Mo-101	F	1.0	$1.4.10^{-10}$	0.8	$9.7.10^{-11}$	$4.4.10^{-11}$	$2.8.10^{-11}$	$1.7.10^{-11}$	$1.4.10^{-11}$
	M	0.2	$2.2.10^{-10}$	0.1	$1.5.10^{-10}$	$7.0.10^{-11}$	$4.5.10^{-11}$	$3.0.10^{-11}$	$2.5.10^{-11}$
	S	0.02	$2.3.10^{-10}$	0.01	$1.6.10^{-10}$	$7.2.10^{-11}$	$4.7.10^{-11}$	$3.1.10^{-11}$	$2.6.10^{-11}$
technetium									
Tc-93	F	1.0	$2.4.10^{-10}$	0.8	$2.1.10^{-10}$	$1.1.10^{-10}$	$6.7.10^{-11}$	$4.0.10^{-11}$	$3.2.10^{-11}$
	M	0.2	$2.7.10^{-10}$	0.1	$2.3.10^{-10}$	$1.2.10^{-10}$	$7.5.10^{-11}$	$4.4.10^{-11}$	$3.5.10^{-11}$
	S	0.02	$2.8.10^{-10}$	0.01	$2.3.10^{-10}$	$1.2.10^{-10}$	$7.6.10^{-11}$	$4.5.10^{-11}$	$3.5.10^{-11}$
Tc-93m	F	1.0	$1.2.10^{-10}$	0.8	$9.8.10^{-11}$	$4.9.10^{-11}$	$2.9.10^{-11}$	$1.8.10^{-11}$	$1.4.10^{-11}$
	M	0.2	$1.4.10^{-10}$	0.1	$1.1.10^{-10}$	$5.4.10^{-11}$	$3.4.10^{-11}$	$2.1.10^{-11}$	$1.7.10^{-11}$
	S	0.02	$1.4.10^{-10}$	0.01	$1.1.10^{-10}$	$5.4.10^{-11}$	$3.4.10^{-11}$	$2.1.10^{-11}$	$1.7.10^{-11}$
Tc-94	F	1.0	$8.9.10^{-10}$	0.8	$7.5.10^{-10}$	$3.9.10^{-10}$	$2.3.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
	M	0.2	$9.8.10^{-10}$	0.1	$8.1.10^{-10}$	$4.2.10^{-10}$	$2.6.10^{-10}$	$1.6.10^{-10}$	$1.2.10^{-10}$
	S	0.02	$9.9.10^{-10}$	0.01	$8.2.10^{-10}$	$4.3.10^{-10}$	$2.7.10^{-10}$	$1.6.10^{-10}$	$1.3.10^{-10}$
Tc-94m	F	1.0	$4.8.10^{-10}$	0.8	$3.4.10^{-10}$	$1.6.10^{-10}$	$8.6.10^{-11}$	$5.2.10^{-11}$	$4.1.10^{-11}$
	M	0.2	$4.4.10^{-10}$	0.1	$3.0.10^{-10}$	$1.4.10^{-10}$	$8.8.10^{-11}$	$5.5.10^{-11}$	$4.5.10^{-11}$
	S	0.02	$4.3.10^{-10}$	0.01	$3.0.10^{-10}$	$1.4.10^{-10}$	$8.8.10^{-11}$	$5.6.10^{-11}$	$4.6.10^{-11}$
Tc-95	F	1.0	$7.5.10^{-10}$	0.8	$6.3.10^{-10}$	$3.3.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$9.6.10^{-11}$
	M	0.2	$8.3.10^{-10}$	0.1	$6.9.10^{-10}$	$3.6.10^{-10}$	$2.2.10^{-10}$	$1.3.10^{-10}$	$1.0.10^{-10}$
	S	0.02	$8.5.10^{-10}$	0.01	$7.0.10^{-10}$	$3.6.10^{-10}$	$2.3.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
Tc-95m	F	1.0	$2.4.10^{-9}$	0.8	$1.8.10^{-9}$	$9.3.10^{-10}$	$5.7.10^{-10}$	$3.6.10^{-10}$	$2.9.10^{-10}$
	M	0.2	$4.9.10^{-9}$	0.1	$4.0.10^{-9}$	$2.3.10^{-9}$	$1.5.10^{-9}$	$1.1.10^{-9}$	$8.8.10^{-10}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
	S	0.02	$6.0.10^{-9}$	0.01	$5.0.10^{-9}$	$2.7.10^{-9}$	$1.8.10^{-9}$	$1.5.10^{-9}$	$1.2.10^{-9}$
Tc-96	F	1.0	$4.2.10^{-9}$	0.8	$3.4.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$7.0.10^{-10}$	$5.7.10^{-10}$
	M	0.2	$4.7.10^{-9}$	0.1	$3.9.10^{-9}$	$2.1.10^{-9}$	$1.3.10^{-9}$	$8.6.10^{-10}$	$6.8.10^{-10}$
	S	0.02	$4.8.10^{-9}$	0.01	$3.9.10^{-9}$	$2.1.10^{-9}$	$1.4.10^{-9}$	$8.9.10^{-10}$	$7.0.10^{-10}$
Tc-96m	F	1.0	$5.3.10^{-11}$	0.8	$4.1.10^{-11}$	$2.1.10^{-11}$	$1.3.10^{-11}$	$7.7.10^{-12}$	$6.2.10^{-12}$
	M	0.2	$5.6.10^{-11}$	0.1	$4.4.10^{-11}$	$2.3.10^{-11}$	$1.4.10^{-11}$	$9.3.10^{-12}$	$7.4.10^{-12}$
	S	0.02	$5.7.10^{-11}$	0.01	$4.4.10^{-11}$	$2.3.10^{-11}$	$1.5.10^{-11}$	$9.5.10^{-12}$	$7.5.10^{-12}$
Tc-97	F	1.0	$5.2.10^{-10}$	0.8	$3.7.10^{-10}$	$1.7.10^{-10}$	$9.4.10^{-11}$	$5.6.10^{-11}$	$4.3.10^{-11}$
	M	0.2	$1.2.10^{-9}$	0.1	$1.0.10^{-9}$	$5.7.10^{-10}$	$3.6.10^{-10}$	$2.8.10^{-10}$	$2.2.10^{-10}$
	S	0.02	$5.0.10^{-9}$	0.01	$4.8.10^{-9}$	$3.3.10^{-9}$	$2.2.10^{-9}$	$1.9.10^{-9}$	$1.8.10^{-9}$
Tc-97m	F	1.0	$3.4.10^{-9}$	0.8	$2.3.10^{-9}$	$9.8.10^{-10}$	$5.6.10^{-10}$	$3.0.10^{-10}$	$2.7.10^{-10}$
	M	0.2	$1.3.10^{-8}$	0.1	$1.0.10^{-8}$	$6.1.10^{-9}$	$4.4.10^{-9}$	$4.1.10^{-9}$	$3.2.10^{-9}$
	S	0.02	$1.6.10^{-8}$	0.01	$1.3.10^{-8}$	$7.8.10^{-9}$	$5.7.10^{-9}$	$5.2.10^{-9}$	$4.1.10^{-9}$
Tc-98	F	1.0	$1.0.10^{-8}$	0.8	$6.8.10^{-9}$	$3.2.10^{-9}$	$1.9.10^{-9}$	$1.2.10^{-9}$	$9.7.10^{-10}$
	M	0.2	$3.5.10^{-8}$	0.1	$2.9.10^{-8}$	$1.7.10^{-8}$	$1.2.10^{-8}$	$1.0.10^{-8}$	$8.3.10^{-9}$
	S	0.02	$1.1.10^{-7}$	0.01	$1.1.10^{-7}$	$7.6.10^{-8}$	$5.4.10^{-8}$	$4.8.10^{-8}$	$4.5.10^{-8}$
Tc-99	F	1.0	$4.0.10^{-9}$	0.8	$2.5.10^{-9}$	$1.0.10^{-9}$	$5.9.10^{-10}$	$3.6.10^{-10}$	$2.9.10^{-10}$
	M	0.2	$1.7.10^{-8}$	0.1	$1.3.10^{-8}$	$8.0.10^{-9}$	$5.7.10^{-9}$	$5.0.10^{-9}$	$4.0.10^{-9}$
	S	0.02	$4.1.10^{-8}$	0.01	$3.7.10^{-8}$	$2.4.10^{-8}$	$1.7.10^{-8}$	$1.5.10^{-8}$	$1.3.10^{-8}$
Tc-99m	F	1.0	$1.2.10^{-10}$	0.8	$8.7.10^{-11}$	$4.1.10^{-11}$	$2.4.10^{-11}$	$1.5.10^{-11}$	$1.2.10^{-11}$
	M	0.2	$1.3.10^{-10}$	0.1	$9.9.10^{-11}$	$5.1.10^{-11}$	$3.4.10^{-11}$	$2.4.10^{-11}$	$1.9.10^{-11}$
	S	0.02	$1.3.10^{-10}$	0.01	$1.0.10^{-10}$	$5.2.10^{-11}$	$3.5.10^{-11}$	$2.5.10^{-11}$	$2.0.10^{-11}$
Tc-101	F	1.0	$8.5.10^{-11}$	0.8	$5.6.10^{-11}$	$2.5.10^{-11}$	$1.6.10^{-11}$	$9.7.10^{-12}$	$8.2.10^{-12}$
	M	0.2	$1.1.10^{-10}$	0.1	$7.1.10^{-11}$	$3.2.10^{-11}$	$2.1.10^{-11}$	$1.4.10^{-11}$	$1.2.10^{-11}$
	S	0.02	$1.1.10^{-10}$	0.01	$7.3.10^{-11}$	$3.3.10^{-11}$	$2.2.10^{-11}$	$1.4.10^{-11}$	$1.2.10^{-11}$
Tc-104	F	1.0	$2.7.10^{-10}$	0.8	$1.8.10^{-10}$	$8.0.10^{-11}$	$4.6.10^{-11}$	$2.8.10^{-11}$	$2.3.10^{-11}$
	M	0.2	$2.9.10^{-10}$	0.1	$1.9.10^{-10}$	$8.6.10^{-11}$	$5.4.10^{-11}$	$3.3.10^{-11}$	$2.8.10^{-11}$
	S	0.02	$2.9.10^{-10}$	0.01	$1.9.10^{-10}$	$8.7.10^{-11}$	$5.4.10^{-11}$	$3.4.10^{-11}$	$2.9.10^{-11}$
ruthenium									
Ru-94	F	0.1	$2.5.10^{-10}$	0.05	$1.9.10^{-10}$	$9.0.10^{-11}$	$5.4.10^{-11}$	$3.1.10^{-11}$	$2.5.10^{-11}$
	M	0.1	$3.8.10^{-10}$	0.05	$2.8.10^{-10}$	$1.3.10^{-10}$	$8.4.10^{-11}$	$5.2.10^{-11}$	$4.2.10^{-11}$
	S	0.02	$4.0.10^{-10}$	0.01	$2.9.10^{-10}$	$1.4.10^{-10}$	$8.7.10^{-11}$	$5.4.10^{-11}$	$4.4.10^{-11}$
Ru-97	F	0.1	$5.5.10^{-10}$	0.05	$4.4.10^{-10}$	$2.2.10^{-10}$	$1.3.10^{-10}$	$7.7.10^{-11}$	$6.2.10^{-11}$
	M	0.1	$7.7.10^{-10}$	0.05	$6.1.10^{-10}$	$3.1.10^{-10}$	$2.0.10^{-10}$	$1.3.10^{-10}$	$1.0.10^{-10}$
	S	0.02	$8.1.10^{-10}$	0.01	$6.3.10^{-10}$	$3.3.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
Ru-103	F	0.1	$4.2.10^{-9}$	0.05	$3.0.10^{-9}$	$1.5.10^{-9}$	$9.3.10^{-10}$	$5.6.10^{-10}$	$4.8.10^{-10}$
	M	0.1	$1.1.10^{-8}$	0.05	$8.4.10^{-9}$	$5.0.10^{-9}$	$3.5.10^{-9}$	$3.0.10^{-9}$	$2.4.10^{-9}$
	S	0.02	$1.3.10^{-8}$	0.01	$1.0.10^{-8}$	$6.0.10^{-9}$	$4.2.10^{-9}$	$3.7.10^{-9}$	$3.0.10^{-9}$
Ru-105	F	0.1	$7.1.10^{-10}$	0.05	$5.1.10^{-10}$	$2.3.10^{-10}$	$1.4.10^{-10}$	$7.9.10^{-11}$	$6.5.10^{-11}$
	M	0.1	$1.3.10^{-9}$	0.05	$9.2.10^{-10}$	$4.5.10^{-10}$	$3.0.10^{-10}$	$2.0.10^{-10}$	$1.7.10^{-10}$
	S	0.02	$1.4.10^{-9}$	0.01	$9.8.10^{-10}$	$4.8.10^{-10}$	$3.2.10^{-10}$	$2.2.10^{-10}$	$1.8.10^{-10}$
Ru-106	F	0.1	$7.2.10^{-8}$	0.05	$5.4.10^{-8}$	$2.6.10^{-8}$	$1.6.10^{-8}$	$9.2.10^{-9}$	$7.9.10^{-9}$
	M	0.1	$1.4.10^{-7}$	0.05	$1.1.10^{-7}$	$6.4.10^{-8}$	$4.1.10^{-8}$	$3.1.10^{-8}$	$2.8.10^{-8}$
	S	0.02	$2.6.10^{-7}$	0.01	$2.3.10^{-7}$	$1.4.10^{-7}$	$9.1.10^{-8}$	$7.1.10^{-8}$	$6.6.10^{-8}$
rhodium									
Rh-99	F	0.1	$2.6.10^{-9}$	0.05	$2.0.10^{-9}$	$9.9.10^{-10}$	$6.2.10^{-10}$	$3.8.10^{-10}$	$3.2.10^{-10}$
	M	0.1	$4.5.10^{-9}$	0.05	$3.5.10^{-9}$	$2.0.10^{-9}$	$1.3.10^{-9}$	$9.6.10^{-10}$	$7.7.10^{-10}$
	S	0.1	$4.9.10^{-9}$	0.05	$3.8.10^{-9}$	$2.2.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$	$8.7.10^{-10}$
Rh-99m	F	0.1	$2.4.10^{-10}$	0.05	$2.0.10^{-10}$	$1.0.10^{-10}$	$6.1.10^{-11}$	$3.5.10^{-11}$	$2.8.10^{-11}$
	M	0.1	$3.1.10^{-10}$	0.05	$2.5.10^{-10}$	$1.3.10^{-10}$	$8.0.10^{-11}$	$4.9.10^{-11}$	$3.9.10^{-11}$
	S	0.1	$3.2.10^{-10}$	0.05	$2.6.10^{-10}$	$1.3.10^{-10}$	$8.2.10^{-11}$	$5.1.10^{-11}$	$4.0.10^{-11}$
Rh-100	F	0.1	$2.1.10^{-9}$	0.05	$1.8.10^{-9}$	$9.1.10^{-10}$	$5.6.10^{-10}$	$3.3.10^{-10}$	$2.6.10^{-10}$
	M	0.1	$2.7.10^{-9}$	0.05	$2.2.10^{-9}$	$1.1.10^{-9}$	$7.1.10^{-10}$	$4.3.10^{-10}$	$3.4.10^{-10}$
	S	0.1	$2.8.10^{-9}$	0.05	$2.2.10^{-9}$	$1.2.10^{-9}$	$7.3.10^{-10}$	$4.4.10^{-10}$	$3.5.10^{-10}$
Rh-101	F	0.1	$7.4.10^{-9}$	0.05	$6.1.10^{-9}$	$3.5.10^{-9}$	$2.3.10^{-9}$	$1.5.10^{-9}$	$1.4.10^{-9}$
	M	0.1	$9.8.10^{-9}$	0.05	$8.0.10^{-9}$	$4.9.10^{-9}$	$3.4.10^{-9}$	$2.8.10^{-9}$	$2.3.10^{-9}$
	S	0.1	$1.9.10^{-8}$	0.05	$1.7.10^{-8}$	$1.1.10^{-8}$	$7.4.10^{-9}$	$6.2.10^{-9}$	$5.4.10^{-9}$
Rh-101m	F	0.1	$8.4.10^{-10}$	0.05	$6.6.10^{-10}$	$3.3.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$9.7.10^{-11}$
	M	0.1	$1.3.10^{-9}$	0.05	$9.8.10^{-10}$	$5.2.10^{-10}$	$3.5.10^{-10}$	$2.5.10^{-10}$	$1.9.10^{-10}$
	S	0.1	$1.3.10^{-9}$	0.05	$1.0.10^{-9}$	$5.5.10^{-10}$	$3.7.10^{-10}$	$2.7.10^{-10}$	$2.1.10^{-10}$
Rh-102m	F	0.1	$3.3.10^{-8}$	0.05	$2.8.10^{-8}$	$1.7.10^{-8}$	$1.1.10^{-8}$	$7.9.10^{-9}$	$7.3.10^{-9}$
	M	0.1	$3.0.10^{-8}$	0.05	$2.5.10^{-8}$	$1.5.10^{-8}$	$1.0.10^{-8}$	$7.9.10^{-9}$	$6.9.10^{-9}$
	S	0.1	$5.4.10^{-8}$	0.05	$5.0.10^{-8}$	$3.5.10^{-8}$	$2.4.10^{-8}$	$2.0.10^{-8}$	$1.7.10^{-8}$
Rh-102	F	0.1	$1.2.10^{-8}$	0.05	$8.7.10^{-9}$	$4.4.10^{-9}$	$2.7.10^{-9}$	$1.7.10^{-9}$	$1.5.10^{-9}$
	M	0.1	$2.0.10^{-8}$	0.05	$1.6.10^{-8}$	$9.0.10^{-9}$	$6.0.10^{-9}$	$4.7.10^{-9}$	$4.0.10^{-9}$
	S	0.1	$3.0.10^{-8}$	0.05	$2.5.10^{-8}$	$1.5.10^{-8}$	$1.0.10^{-8}$	$8.2.10^{-9}$	$7.1.10^{-9}$
Rh-103m	F	0.1	$8.6.10^{-12}$	0.05	$5.9.10^{-12}$	$2.7.10^{-12}$	$1.6.10^{-12}$	$1.0.10^{-12}$	$8.6.10^{-13}$
	M	0.1	$1.9.10^{-11}$	0.05	$1.2.10^{-11}$	$6.3.10^{-12}$	$4.0.10^{-12}$	$3.0.10^{-12}$	$2.5.10^{-12}$
	S	0.1	$2.0.10^{-11}$	0.05	$1.3.10^{-11}$	$6.7.10^{-12}$	$4.3.10^{-12}$	$3.2.10^{-12}$	$2.7.10^{-12}$
Rh-105	F	0.1	$1.0.10^{-9}$	0.05	$6.9.10^{-10}$	$3.0.10^{-10}$	$1.8.10^{-10}$	$9.6.10^{-11}$	$8.2.10^{-11}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
	M	0.1	$2.2.10^{-9}$	0.05	$1.6.10^{-9}$	$7.4.10^{-10}$	$5.2.10^{-10}$	$4.1.10^{-10}$	$3.2.10^{-10}$
	S	0.1	$2.4.10^{-9}$	0.05	$1.7.10^{-9}$	$8.0.10^{-10}$	$5.6.10^{-10}$	$4.5.10^{-10}$	$3.5.10^{-10}$
Rh-106m	F	0.1	$5.7.10^{-10}$	0.05	$4.5.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$8.0.10^{-11}$	$6.5.10^{-11}$
	M	0.1	$8.2.10^{-10}$	0.05	$6.3.10^{-10}$	$3.2.10^{-10}$	$2.0.10^{-10}$	$1.3.10^{-10}$	$1.1.10^{-10}$
	S	0.1	$8.5.10^{-10}$	0.05	$6.5.10^{-10}$	$3.3.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
Rh-107	F	0.1	$8.9.10^{-11}$	0.05	$5.9.10^{-11}$	$2.6.10^{-11}$	$1.7.10^{-11}$	$1.0.10^{-11}$	$9.0.10^{-12}$
	M	0.1	$1.4.10^{-10}$	0.05	$9.3.10^{-11}$	$4.2.10^{-11}$	$2.8.10^{-11}$	$1.9.10^{-11}$	$1.6.10^{-11}$
	S	0.1	$1.5.10^{-10}$	0.05	$9.7.10^{-11}$	$4.4.10^{-11}$	$2.9.10^{-11}$	$1.9.10^{-11}$	$1.7.10^{-11}$
palladium									
Pd-100	F	0.05	$3.9.10^{-9}$	0.005	$3.0.10^{-9}$	$1.5.10^{-9}$	$9.7.10^{-10}$	$5.8.10^{-10}$	$4.7.10^{-10}$
	M	0.05	$5.2.10^{-9}$	0.005	$4.0.10^{-9}$	$2.2.10^{-9}$	$1.4.10^{-9}$	$9.9.10^{-10}$	$8.0.10^{-10}$
	S	0.05	$5.3.10^{-9}$	0.005	$4.1.10^{-9}$	$2.2.10^{-9}$	$1.5.10^{-9}$	$1.0.10^{-9}$	$8.5.10^{-10}$
Pd-101	F	0.05	$3.6.10^{-10}$	0.005	$2.9.10^{-10}$	$1.4.10^{-10}$	$8.6.10^{-11}$	$4.9.10^{-11}$	$3.9.10^{-11}$
	M	0.05	$4.8.10^{-10}$	0.005	$3.8.10^{-10}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$7.5.10^{-11}$	$5.9.10^{-11}$
	S	0.05	$5.0.10^{-10}$	0.005	$3.9.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$7.8.10^{-11}$	$6.2.10^{-11}$
Pd-103	F	0.05	$9.7.10^{-10}$	0.005	$6.5.10^{-10}$	$3.0.10^{-10}$	$1.9.10^{-10}$	$1.1.10^{-10}$	$8.9.10^{-11}$
	M	0.05	$2.3.10^{-9}$	0.005	$1.6.10^{-9}$	$9.0.10^{-10}$	$5.9.10^{-10}$	$4.5.10^{-10}$	$3.8.10^{-10}$
	S	0.05	$2.5.10^{-9}$	0.005	$1.8.10^{-9}$	$1.0.10^{-9}$	$6.8.10^{-10}$	$5.3.10^{-10}$	$4.5.10^{-10}$
Pd-107	F	0.05	$2.6.10^{-10}$	0.005	$1.8.10^{-10}$	$8.2.10^{-11}$	$5.2.10^{-11}$	$3.1.10^{-11}$	$2.5.10^{-11}$
	M	0.05	$6.5.10^{-10}$	0.005	$5.0.10^{-10}$	$2.6.10^{-10}$	$1.5.10^{-10}$	$1.0.10^{-10}$	$8.5.10^{-11}$
	S	0.05	$2.2.10^{-9}$	0.005	$2.0.10^{-9}$	$1.3.10^{-9}$	$7.8.10^{-10}$	$6.2.10^{-10}$	$5.9.10^{-10}$
Pd-109	F	0.05	$1.5.10^{-9}$	0.005	$9.9.10^{-10}$	$4.2.10^{-10}$	$2.6.10^{-10}$	$1.4.10^{-10}$	$1.2.10^{-10}$
	M	0.05	$2.6.10^{-9}$	0.005	$1.8.10^{-9}$	$8.8.10^{-10}$	$5.9.10^{-10}$	$4.3.10^{-10}$	$3.4.10^{-10}$
	S	0.05	$2.7.10^{-9}$	0.005	$1.9.10^{-9}$	$9.3.10^{-10}$	$6.3.10^{-10}$	$4.6.10^{-10}$	$3.7.10^{-10}$
silver									
Ag-102	F	0.1	$1.2.10^{-10}$	0.05	$8.6.10^{-11}$	$4.2.10^{-11}$	$2.6.10^{-11}$	$1.5.10^{-11}$	$1.3.10^{-11}$
	M	0.1	$1.6.10^{-10}$	0.05	$1.1.10^{-10}$	$5.5.10^{-11}$	$3.4.10^{-11}$	$2.1.10^{-11}$	$1.7.10^{-11}$
	S	0.02	$1.6.10^{-10}$	0.01	$1.2.10^{-10}$	$5.6.10^{-11}$	$3.5.10^{-11}$	$2.2.10^{-11}$	$1.8.10^{-11}$
Ag-103	F	0.1	$1.4.10^{-10}$	0.05	$1.0.10^{-10}$	$4.9.10^{-11}$	$3.0.10^{-11}$	$1.8.10^{-11}$	$1.4.10^{-11}$
	M	0.1	$2.2.10^{-10}$	0.05	$1.6.10^{-10}$	$7.6.10^{-11}$	$4.8.10^{-11}$	$3.2.10^{-11}$	$2.6.10^{-11}$
	S	0.02	$2.3.10^{-10}$	0.01	$1.6.10^{-10}$	$7.9.10^{-11}$	$5.1.10^{-11}$	$3.3.10^{-11}$	$2.7.10^{-11}$
Ag-104	F	0.1	$2.3.10^{-10}$	0.05	$1.9.10^{-10}$	$9.8.10^{-11}$	$5.9.10^{-11}$	$3.5.10^{-11}$	$2.8.10^{-11}$
	M	0.1	$2.9.10^{-10}$	0.05	$2.3.10^{-10}$	$1.2.10^{-10}$	$7.4.10^{-11}$	$4.5.10^{-11}$	$3.6.10^{-11}$
	S	0.02	$2.9.10^{-10}$	0.01	$2.4.10^{-10}$	$1.2.10^{-10}$	$7.6.10^{-11}$	$4.6.10^{-11}$	$3.7.10^{-11}$
Ag-104m	F	0.1	$1.6.10^{-10}$	0.05	$1.1.10^{-10}$	$5.5.10^{-11}$	$3.4.10^{-11}$	$2.0.10^{-11}$	$1.6.10^{-11}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
	M	0.1	$2.3.10^{-10}$	0.05	$1.6.10^{-10}$	$7.7.10^{-11}$	$4.8.10^{-11}$	$3.0.10^{-11}$	$2.5.10^{-11}$
	S	0.02	$2.4.10^{-10}$	0.01	$1.7.10^{-10}$	$8.0.10^{-11}$	$5.0.10^{-11}$	$3.1.10^{-11}$	$2.6.10^{-11}$
Ag-105	F	0.1	$3.9.10^{-9}$	0.05	$3.4.10^{-9}$	$1.7.10^{-9}$	$1.0.10^{-9}$	$6.4.10^{-10}$	$5.4.10^{-10}$
	M	0.1	$4.5.10^{-9}$	0.05	$3.5.10^{-9}$	$2.0.10^{-9}$	$1.3.10^{-9}$	$9.0.10^{-10}$	$7.3.10^{-10}$
	S	0.02	$4.5.10^{-9}$	0.01	$3.6.10^{-9}$	$2.1.10^{-9}$	$1.3.10^{-9}$	$1.0.10^{-9}$	$8.1.10^{-10}$
Ag-106	F	0.1	$9.4.10^{-11}$	0.05	$6.4.10^{-11}$	$2.9.10^{-11}$	$1.8.10^{-11}$	$1.1.10^{-11}$	$9.1.10^{-12}$
	M	0.1	$1.4.10^{-10}$	0.05	$9.5.10^{-11}$	$4.4.10^{-11}$	$2.8.10^{-11}$	$1.8.10^{-11}$	$1.5.10^{-11}$
	S	0.02	$1.5.10^{-10}$	0.01	$9.9.10^{-11}$	$4.5.10^{-11}$	$2.9.10^{-11}$	$1.9.10^{-11}$	$1.6.10^{-11}$
Ag-106m	F	0.1	$7.7.10^{-9}$	0.05	$6.1.10^{-9}$	$3.2.10^{-9}$	$2.1.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$
	M	0.1	$7.2.10^{-9}$	0.05	$5.8.10^{-9}$	$3.2.10^{-9}$	$2.1.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
	S	0.02	$7.0.10^{-9}$	0.01	$5.7.10^{-9}$	$3.2.10^{-9}$	$2.1.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
Ag-108m	F	0.1	$3.5.10^{-8}$	0.05	$2.8.10^{-8}$	$1.6.10^{-8}$	$1.0.10^{-8}$	$6.9.10^{-9}$	$6.1.10^{-9}$
	M	0.1	$3.3.10^{-8}$	0.05	$2.7.10^{-8}$	$1.7.10^{-8}$	$1.1.10^{-8}$	$8.6.10^{-9}$	$7.4.10^{-9}$
	S	0.02	$8.9.10^{-8}$	0.01	$8.7.10^{-8}$	$6.2.10^{-8}$	$4.4.10^{-8}$	$3.9.10^{-8}$	$3.7.10^{-8}$
Ag-110m	F	0.1	$3.5.10^{-8}$	0.05	$2.8.10^{-8}$	$1.5.10^{-8}$	$9.7.10^{-9}$	$6.3.10^{-9}$	$5.5.10^{-9}$
	M	0.1	$3.5.10^{-8}$	0.05	$2.8.10^{-8}$	$1.7.10^{-8}$	$1.2.10^{-8}$	$9.2.10^{-9}$	$7.6.10^{-9}$
	S	0.02	$4.6.10^{-8}$	0.01	$4.1.10^{-8}$	$2.6.10^{-8}$	$1.8.10^{-8}$	$1.5.10^{-8}$	$1.2.10^{-8}$
Ag-111	F	0.1	$4.8.10^{-9}$	0.05	$3.2.10^{-9}$	$1.4.10^{-9}$	$8.8.10^{-10}$	$4.8.10^{-10}$	$4.0.10^{-10}$
	M	0.1	$9.2.10^{-9}$	0.05	$6.6.10^{-9}$	$3.5.10^{-9}$	$2.4.10^{-9}$	$1.9.10^{-9}$	$1.5.10^{-9}$
	S	0.02	$9.9.10^{-9}$	0.01	$7.1.10^{-9}$	$3.8.10^{-9}$	$2.7.10^{-9}$	$2.1.10^{-9}$	$1.7.10^{-9}$
Ag-112	F	0.1	$9.8.10^{-10}$	0.05	$6.4.10^{-10}$	$2.8.10^{-10}$	$1.7.10^{-10}$	$9.1.10^{-11}$	$7.6.10^{-11}$
	M	0.1	$1.7.10^{-9}$	0.05	$1.1.10^{-9}$	$5.1.10^{-10}$	$3.2.10^{-10}$	$2.0.10^{-10}$	$1.6.10^{-10}$
	S	0.02	$1.8.10^{-9}$	0.01	$1.2.10^{-9}$	$5.4.10^{-10}$	$3.4.10^{-10}$	$2.1.10^{-10}$	$1.7.10^{-10}$
Ag-115	F	0.1	$1.6.10^{-10}$	0.05	$1.0.10^{-10}$	$4.6.10^{-11}$	$2.9.10^{-11}$	$1.7.10^{-11}$	$1.5.10^{-11}$
	M	0.1	$2.5.10^{-10}$	0.05	$1.7.10^{-10}$	$7.6.10^{-11}$	$4.9.10^{-11}$	$3.2.10^{-11}$	$2.7.10^{-11}$
	S	0.02	$2.7.10^{-10}$	0.01	$1.7.10^{-10}$	$8.0.10^{-11}$	$5.2.10^{-11}$	$3.4.10^{-11}$	$2.9.10^{-11}$
cadmium									
Cd-104	F	0.1	$2.0.10^{-10}$	0.05	$1.7.10^{-10}$	$8.7.10^{-11}$	$5.2.10^{-11}$	$3.1.10^{-11}$	$2.4.10^{-11}$
	M	0.1	$2.6.10^{-10}$	0.05	$2.1.10^{-10}$	$1.1.10^{-10}$	$6.9.10^{-11}$	$4.2.10^{-11}$	$3.4.10^{-11}$
	S	0.1	$2.7.10^{-10}$	0.05	$2.2.10^{-10}$	$1.1.10^{-10}$	$7.0.10^{-11}$	$4.4.10^{-11}$	$3.5.10^{-11}$
Cd-107	F	0.1	$2.3.10^{-10}$	0.05	$1.7.10^{-10}$	$7.4.10^{-11}$	$4.6.10^{-11}$	$2.5.10^{-11}$	$2.1.10^{-11}$
	M	0.1	$5.2.10^{-10}$	0.05	$3.7.10^{-10}$	$2.0.10^{-10}$	$1.3.10^{-10}$	$8.8.10^{-11}$	$8.3.10^{-11}$
	S	0.1	$5.5.10^{-10}$	0.05	$3.9.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$9.7.10^{-11}$	$7.7.10^{-11}$
Cd-109	F	0.1	$4.5.10^{-8}$	0.05	$3.7.10^{-8}$	$2.1.10^{-8}$	$1.4.10^{-8}$	$9.3.10^{-9}$	$8.1.10^{-9}$
	M	0.1	$3.0.10^{-8}$	0.05	$2.3.10^{-8}$	$1.4.10^{-8}$	$9.5.10^{-9}$	$7.8.10^{-9}$	$6.6.10^{-9}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
	S	0.1	$2.7.10^{-8}$	0.05	$2.1.10^{-8}$	$1.3.10^{-8}$	$8.9.10^{-9}$	$7.6.10^{-9}$	$6.2.10^{-9}$
Cd-113	F	0.1	$2.6.10^{-7}$	0.05	$2.4.10^{-7}$	$1.7.10^{-7}$	$1.4.10^{-7}$	$1.2.10^{-7}$	$1.2.10^{-7}$
	M	0.1	$1.2.10^{-7}$	0.05	$1.0.10^{-7}$	$7.6.10^{-8}$	$6.1.10^{-8}$	$5.7.10^{-8}$	$5.5.10^{-8}$
	S	0.1	$7.8.10^{-8}$	0.05	$5.8.10^{-8}$	$4.1.10^{-8}$	$3.0.10^{-8}$	$2.7.10^{-8}$	$2.6.10^{-8}$
Cd-113m	F	0.1	$3.0.10^{-7}$	0.05	$2.7.10^{-7}$	$1.8.10^{-7}$	$1.3.10^{-7}$	$1.1.10^{-7}$	$1.1.10^{-7}$
	M	0.1	$1.4.10^{-7}$	0.05	$1.2.10^{-7}$	$8.1.10^{-8}$	$6.0.10^{-8}$	$5.3.10^{-8}$	$5.2.10^{-8}$
	S	0.1	$1.1.10^{-7}$	0.05	$8.4.10^{-8}$	$5.5.10^{-8}$	$3.9.10^{-8}$	$3.3.10^{-8}$	$3.1.10^{-8}$
Cd-115	F	0.1	$4.0.10^{-9}$	0.05	$2.6.10^{-9}$	$1.2.10^{-9}$	$7.5.10^{-10}$	$4.3.10^{-10}$	$3.5.10^{-10}$
	M	0.1	$6.7.10^{-9}$	0.05	$4.8.10^{-9}$	$2.4.10^{-9}$	$1.7.10^{-9}$	$1.2.10^{-9}$	$9.8.10^{-10}$
	S	0.1	$7.2.10^{-9}$	0.05	$5.1.10^{-9}$	$2.6.10^{-9}$	$1.8.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$
Cd-115m	F	0.1	$4.6.10^{-8}$	0.05	$3.2.10^{-8}$	$1.5.10^{-8}$	$1.0.10^{-8}$	$6.4.10^{-9}$	$5.3.10^{-9}$
	M	0.1	$4.0.10^{-8}$	0.05	$2.5.10^{-8}$	$1.4.10^{-8}$	$9.4.10^{-9}$	$7.3.10^{-9}$	$6.2.10^{-9}$
	S	0.1	$3.9.10^{-8}$	0.05	$3.0.10^{-8}$	$1.7.10^{-8}$	$1.1.10^{-8}$	$8.9.10^{-9}$	$7.7.10^{-9}$
Cd-117	F	0.1	$7.4.10^{-10}$	0.05	$5.2.10^{-10}$	$2.4.10^{-10}$	$1.5.10^{-10}$	$8.1.10^{-11}$	$6.7.10^{-11}$
	M	0.1	$1.3.10^{-9}$	0.05	$9.3.10^{-10}$	$4.5.10^{-10}$	$2.9.10^{-10}$	$2.0.10^{-10}$	$1.6.10^{-10}$
	S	0.1	$1.4.10^{-9}$	0.05	$9.8.10^{-10}$	$4.8.10^{-10}$	$3.1.10^{-10}$	$2.1.10^{-10}$	$1.7.10^{-10}$
Cd-117m	F	0.1	$8.9.10^{-10}$	0.05	$6.7.10^{-10}$	$3.3.10^{-10}$	$2.0.10^{-10}$	$1.1.10^{-10}$	$9.4.10^{-11}$
	M	0.1	$1.5.10^{-9}$	0.05	$1.1.10^{-9}$	$5.5.10^{-10}$	$3.6.10^{-10}$	$2.4.10^{-10}$	$2.0.10^{-10}$
	S	0.1	$1.5.10^{-9}$	0.05	$1.1.10^{-9}$	$5.7.10^{-10}$	$3.8.10^{-10}$	$2.6.10^{-10}$	$2.1.10^{-10}$
indium									
In-109	F	0.04	$2.6.10^{-10}$	0.02	$2.1.10^{-10}$	$1.0.10^{-10}$	$6.3.10^{-11}$	$3.6.10^{-11}$	$2.9.10^{-11}$
	M	0.04	$3.3.10^{-10}$	0.02	$2.6.10^{-10}$	$1.3.10^{-10}$	$8.4.10^{-11}$	$5.3.10^{-11}$	$4.2.10^{-11}$
In-110	F	0.04	$8.2.10^{-10}$	0.02	$7.1.10^{-10}$	$3.7.10^{-10}$	$2.3.10^{-10}$	$1.3.10^{-10}$	$1.1.10^{-10}$
	M	0.04	$9.9.10^{-10}$	0.02	$8.3.10^{-10}$	$4.4.10^{-10}$	$2.7.10^{-10}$	$1.6.10^{-10}$	$1.3.10^{-10}$
In-110m	F	0.04	$3.0.10^{-10}$	0.02	$2.1.10^{-10}$	$9.9.10^{-11}$	$6.0.10^{-11}$	$3.5.10^{-11}$	$2.8.10^{-11}$
	M	0.04	$4.5.10^{-10}$	0.02	$3.1.10^{-10}$	$1.5.10^{-10}$	$9.2.10^{-11}$	$5.8.10^{-11}$	$4.7.10^{-11}$
In-111	F	0.04	$1.2.10^{-9}$	0.02	$8.6.10^{-10}$	$4.2.10^{-10}$	$2.6.10^{-10}$	$1.5.10^{-10}$	$1.3.10^{-10}$
	M	0.04	$1.5.10^{-9}$	0.02	$1.2.10^{-9}$	$6.2.10^{-10}$	$4.1.10^{-10}$	$2.9.10^{-10}$	$2.3.10^{-10}$
In-112	F	0.04	$4.4.10^{-11}$	0.02	$3.0.10^{-11}$	$1.3.10^{-11}$	$8.7.10^{-12}$	$5.4.10^{-12}$	$4.7.10^{-12}$
	M	0.04	$6.5.10^{-11}$	0.02	$4.4.10^{-11}$	$2.0.10^{-11}$	$1.3.10^{-11}$	$8.7.10^{-12}$	$7.4.10^{-12}$
In-113m	F	0.04	$1.0.10^{-10}$	0.02	$7.0.10^{-11}$	$3.2.10^{-11}$	$2.0.10^{-11}$	$1.2.10^{-11}$	$9.7.10^{-12}$
	M	0.04	$1.6.10^{-10}$	0.02	$1.1.10^{-10}$	$5.5.10^{-11}$	$3.6.10^{-11}$	$2.4.10^{-11}$	$2.0.10^{-11}$
In-114m	F	0.04	$1.2.10^{-7}$	0.02	$7.7.10^{-8}$	$3.4.10^{-8}$	$1.9.10^{-8}$	$1.1.10^{-8}$	$9.3.10^{-9}$
	M	0.04	$4.8.10^{-8}$	0.02	$3.3.10^{-8}$	$1.6.10^{-8}$	$1.0.10^{-8}$	$7.8.10^{-9}$	$6.1.10^{-9}$
In-115	F	0.04	$8.3.10^{-7}$	0.02	$7.8.10^{-7}$	$5.5.10^{-7}$	$5.0.10^{-7}$	$4.2.10^{-7}$	$3.9.10^{-7}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
	M	0.04	$3.0.10^{-7}$	0.02	$2.8.10^{-7}$	$2.1.10^{-7}$	$1.9.10^{-7}$	$1.7.10^{-7}$	$1.6.10^{-7}$
In-115m	F	0.04	$2.8.10^{-10}$	0.02	$1.9.10^{-10}$	$8.4.10^{-11}$	$5.1.10^{-11}$	$2.8.10^{-11}$	$2.4.10^{-11}$
	M	0.04	$4.7.10^{-10}$	0.02	$3.3.10^{-10}$	$1.6.10^{-10}$	$1.0.10^{-10}$	$7.2.10^{-11}$	$5.9.10^{-11}$
In-116m	F	0.04	$2.5.10^{-10}$	0.02	$1.9.10^{-10}$	$9.2.10^{-11}$	$5.7.10^{-11}$	$3.4.10^{-11}$	$2.8.10^{-11}$
	M	0.04	$3.6.10^{-10}$	0.02	$2.7.10^{-10}$	$1.3.10^{-10}$	$8.5.10^{-11}$	$5.6.10^{-11}$	$4.5.10^{-11}$
In-117	F	0.04	$1.4.10^{-10}$	0.02	$9.7.10^{-11}$	$4.5.10^{-11}$	$2.8.10^{-11}$	$1.7.10^{-11}$	$1.5.10^{-11}$
	M	0.04	$2.3.10^{-10}$	0.02	$1.6.10^{-10}$	$7.5.10^{-11}$	$5.0.10^{-11}$	$3.5.10^{-11}$	$2.9.10^{-11}$
In-117m	F	0.04	$3.4.10^{-10}$	0.02	$2.3.10^{-10}$	$1.0.10^{-10}$	$6.2.10^{-11}$	$3.5.10^{-11}$	$2.9.10^{-11}$
	M	0.04	$6.0.10^{-10}$	0.02	$4.0.10^{-10}$	$1.9.10^{-10}$	$1.3.10^{-10}$	$8.7.10^{-11}$	$7.2.10^{-11}$
In-119m	F	0.04	$1.2.10^{-10}$	0.02	$7.3.10^{-11}$	$3.1.10^{-11}$	$2.0.10^{-11}$	$1.2.10^{-11}$	$1.0.10^{-11}$
	M	0.04	$1.8.10^{-10}$	0.02	$1.1.10^{-10}$	$4.9.10^{-11}$	$3.2.10^{-11}$	$2.0.10^{-11}$	$1.7.10^{-11}$
tin									
Sn-110	F	0.04	$1.0.10^{-9}$	0.02	$7.6.10^{-10}$	$3.6.10^{-10}$	$2.2.10^{-10}$	$1.2.10^{-10}$	$9.9.10^{-11}$
	M	0.04	$1.5.10^{-9}$	0.02	$1.1.10^{-9}$	$5.1.10^{-10}$	$3.2.10^{-10}$	$1.9.10^{-10}$	$1.6.10^{-10}$
Sn-111	F	0.04	$7.7.10^{-11}$	0.02	$5.4.10^{-11}$	$2.6.10^{-11}$	$1.6.10^{-11}$	$9.4.10^{-12}$	$7.8.10^{-12}$
	M	0.04	$1.1.10^{-10}$	0.02	$8.0.10^{-11}$	$3.8.10^{-11}$	$2.5.10^{-11}$	$1.6.10^{-11}$	$1.3.10^{-11}$
Sn-113	F	0.04	$5.1.10^{-9}$	0.02	$3.7.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$6.4.10^{-10}$	$5.4.10^{-10}$
	M	0.04	$1.3.10^{-8}$	0.02	$1.0.10^{-8}$	$5.8.10^{-9}$	$4.0.10^{-9}$	$3.2.10^{-9}$	$2.7.10^{-9}$
Sn-117m	F	0.04	$3.3.10^{-9}$	0.02	$2.2.10^{-9}$	$1.0.10^{-9}$	$6.1.10^{-10}$	$3.4.10^{-10}$	$2.8.10^{-10}$
	M	0.04	$1.0.10^{-8}$	0.02	$7.7.10^{-9}$	$4.6.10^{-9}$	$3.4.10^{-9}$	$3.1.10^{-9}$	$2.4.10^{-9}$
Sn-119m	F	0.04	$3.0.10^{-9}$	0.02	$2.2.10^{-9}$	$1.0.10^{-9}$	$6.0.10^{-10}$	$3.4.10^{-10}$	$2.8.10^{-10}$
	M	0.04	$1.0.10^{-8}$	0.02	$7.9.10^{-9}$	$4.7.10^{-9}$	$3.1.10^{-9}$	$2.6.10^{-9}$	$2.2.10^{-9}$
Sn-121	F	0.04	$7.7.10^{-10}$	0.02	$5.0.10^{-10}$	$2.2.10^{-10}$	$1.3.10^{-10}$	$7.0.10^{-11}$	$6.0.10^{-11}$
	M	0.04	$1.5.10^{-9}$	0.02	$1.1.10^{-9}$	$5.1.10^{-10}$	$3.6.10^{-10}$	$2.9.10^{-10}$	$2.3.10^{-10}$
Sn-121m	F	0.04	$6.9.10^{-9}$	0.02	$5.4.10^{-9}$	$2.8.10^{-9}$	$1.6.10^{-9}$	$9.4.10^{-10}$	$8.0.10^{-10}$
	M	0.04	$1.9.10^{-8}$	0.02	$1.5.10^{-8}$	$9.2.10^{-9}$	$6.4.10^{-9}$	$5.5.10^{-9}$	$4.5.10^{-9}$
Sn-123	F	0.04	$1.4.10^{-8}$	0.02	$9.9.10^{-9}$	$4.5.10^{-9}$	$2.6.10^{-9}$	$1.4.10^{-9}$	$1.2.10^{-9}$
	M	0.04	$4.0.10^{-8}$	0.02	$3.1.10^{-8}$	$1.8.10^{-8}$	$1.2.10^{-8}$	$9.5.10^{-9}$	$8.1.10^{-9}$
Sn-123m	F	0.04	$1.4.10^{-10}$	0.02	$8.9.10^{-11}$	$3.9.10^{-11}$	$2.5.10^{-11}$	$1.5.10^{-11}$	$1.3.10^{-11}$
	M	0.04	$2.3.10^{-10}$	0.02	$1.5.10^{-10}$	$7.0.10^{-11}$	$4.6.10^{-11}$	$3.2.10^{-11}$	$2.7.10^{-11}$
Sn-125	F	0.04	$1.2.10^{-8}$	0.02	$8.0.10^{-9}$	$3.5.10^{-9}$	$2.0.10^{-9}$	$1.1.10^{-9}$	$8.9.10^{-10}$
	M	0.04	$2.1.10^{-8}$	0.02	$1.5.10^{-8}$	$7.6.10^{-9}$	$5.0.10^{-9}$	$3.6.10^{-9}$	$3.1.10^{-9}$
Sn-126	F	0.04	$7.3.10^{-8}$	0.02	$5.9.10^{-8}$	$3.2.10^{-8}$	$2.0.10^{-8}$	$1.3.10^{-8}$	$1.1.10^{-8}$
	M	0.04	$1.2.10^{-7}$	0.02	$1.0.10^{-7}$	$6.2.10^{-8}$	$4.1.10^{-8}$	$3.3.10^{-8}$	$2.8.10^{-8}$
Sn-127	F	0.04	$6.6.10^{-10}$	0.02	$4.7.10^{-10}$	$2.3.10^{-10}$	$1.4.10^{-10}$	$7.9.10^{-11}$	$6.5.10^{-11}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
	M	0.04	$1.0.10^{-9}$	0.02	$7.4.10^{-10}$	$3.7.10^{-10}$	$2.4.10^{-10}$	$1.6.10^{-10}$	$1.3.10^{-10}$
Sn-128	F	0.04	$5.1.10^{-10}$	0.02	$3.6.10^{-10}$	$1.7.10^{-10}$	$1.0.10^{-10}$	$6.1.10^{-11}$	$5.0.10^{-11}$
	M	0.04	$8.0.10^{-10}$	0.02	$5.5.10^{-10}$	$2.7.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$9.2.10^{-11}$
antimony									
Sb-115	F	0.2	$8.1.10^{-11}$	0.1	$5.9.10^{-11}$	$2.8.10^{-11}$	$1.7.10^{-11}$	$1.0.10^{-11}$	$8.5.10^{-12}$
	M	0.02	$1.2.10^{-10}$	0.01	$8.3.10^{-11}$	$4.0.10^{-11}$	$2.5.10^{-11}$	$1.6.10^{-11}$	$1.3.10^{-11}$
	S	0.02	$1.2.10^{-10}$	0.01	$8.6.10^{-11}$	$4.1.10^{-11}$	$2.6.10^{-11}$	$1.7.10^{-11}$	$1.4.10^{-11}$
Sb-116	F	0.2	$8.4.10^{-11}$	0.1	$6.2.10^{-11}$	$3.0.10^{-11}$	$1.9.10^{-11}$	$1.1.10^{-11}$	$9.1.10^{-12}$
	M	0.02	$1.1.10^{-10}$	0.01	$8.2.10^{-11}$	$4.0.10^{-11}$	$2.5.10^{-11}$	$1.5.10^{-11}$	$1.3.10^{-11}$
	S	0.02	$1.2.10^{-10}$	0.01	$8.5.10^{-11}$	$4.1.10^{-11}$	$2.6.10^{-11}$	$1.6.10^{-11}$	$1.3.10^{-11}$
Sb-116m	F	0.2	$2.6.10^{-10}$	0.1	$2.1.10^{-10}$	$1.1.10^{-10}$	$6.6.10^{-11}$	$4.0.10^{-11}$	$3.2.10^{-11}$
	M	0.02	$3.6.10^{-10}$	0.01	$2.8.10^{-10}$	$1.5.10^{-10}$	$9.1.10^{-11}$	$5.9.10^{-11}$	$4.7.10^{-11}$
	S	0.02	$3.7.10^{-10}$	0.01	$2.9.10^{-10}$	$1.5.10^{-10}$	$9.4.10^{-11}$	$6.1.10^{-11}$	$4.9.10^{-11}$
Sb-117	F	0.2	$7.7.10^{-11}$	0.1	$6.0.10^{-11}$	$2.9.10^{-11}$	$1.8.10^{-11}$	$1.0.10^{-11}$	$8.5.10^{-12}$
	M	0.02	$1.2.10^{-10}$	0.01	$9.1.10^{-11}$	$4.6.10^{-11}$	$3.0.10^{-11}$	$2.0.10^{-11}$	$1.6.10^{-11}$
	S	0.02	$1.3.10^{-10}$	0.01	$9.5.10^{-11}$	$4.8.10^{-11}$	$3.1.10^{-11}$	$2.2.10^{-11}$	$1.7.10^{-11}$
Sb-118m	F	0.2	$7.3.10^{-10}$	0.1	$6.2.10^{-10}$	$3.3.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$9.3.10^{-11}$
	M	0.02	$9.3.10^{-10}$	0.01	$7.6.10^{-10}$	$4.0.10^{-10}$	$2.5.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
	S	0.02	$9.5.10^{-10}$	0.01	$7.8.10^{-10}$	$4.1.10^{-10}$	$2.5.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
Sb-119	F	0.2	$2.7.10^{-10}$	0.1	$2.0.10^{-10}$	$9.4.10^{-11}$	$5.5.10^{-11}$	$2.9.10^{-11}$	$2.3.10^{-11}$
	M	0.02	$4.0.10^{-10}$	0.01	$2.8.10^{-10}$	$1.3.10^{-10}$	$7.9.10^{-11}$	$4.4.10^{-11}$	$3.5.10^{-11}$
	S	0.02	$4.1.10^{-10}$	0.01	$2.9.10^{-10}$	$1.4.10^{-10}$	$8.2.10^{-11}$	$4.5.10^{-11}$	$3.6.10^{-11}$
Sb-120m	F	0.2	$4.1.10^{-9}$	0.1	$3.3.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$6.7.10^{-10}$	$5.5.10^{-10}$
	M	0.02	$6.3.10^{-9}$	0.01	$5.0.10^{-9}$	$2.8.10^{-9}$	$1.8.10^{-9}$	$1.3.10^{-9}$	$1.0.10^{-9}$
	S	0.02	$6.6.10^{-9}$	0.01	$5.3.10^{-9}$	$2.9.10^{-9}$	$1.9.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
Sb-120	F	0.2	$4.6.10^{-11}$	0.1	$3.1.10^{-11}$	$1.4.10^{-11}$	$8.9.10^{-12}$	$5.4.10^{-12}$	$4.6.10^{-12}$
	M	0.02	$6.6.10^{-11}$	0.01	$4.4.10^{-11}$	$2.0.10^{-11}$	$1.3.10^{-11}$	$8.3.10^{-12}$	$7.0.10^{-12}$
	S	0.02	$6.8.10^{-11}$	0.01	$4.6.10^{-11}$	$2.1.10^{-11}$	$1.4.10^{-11}$	$8.7.10^{-12}$	$7.3.10^{-12}$
Sb-122	F	0.2	$4.2.10^{-9}$	0.1	$2.8.10^{-9}$	$1.4.10^{-9}$	$8.4.10^{-10}$	$4.4.10^{-10}$	$3.6.10^{-10}$
	M	0.02	$8.3.10^{-9}$	0.01	$5.7.10^{-9}$	$2.8.10^{-9}$	$1.8.10^{-9}$	$1.3.10^{-9}$	$1.0.10^{-9}$
	S	0.02	$8.8.10^{-9}$	0.01	$6.1.10^{-9}$	$3.0.10^{-9}$	$2.0.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
Sb-124	F	0.2	$1.2.10^{-8}$	0.1	$8.8.10^{-9}$	$4.3.10^{-9}$	$2.6.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
	M	0.02	$3.1.10^{-8}$	0.01	$2.4.10^{-8}$	$1.4.10^{-8}$	$9.6.10^{-9}$	$7.7.10^{-9}$	$6.4.10^{-9}$
	S	0.02	$3.9.10^{-8}$	0.01	$3.1.10^{-8}$	$1.8.10^{-8}$	$1.3.10^{-8}$	$1.0.10^{-8}$	$8.6.10^{-9}$
Sb-124m	F	0.2	$2.7.10^{-11}$	0.1	$1.9.10^{-11}$	$9.0.10^{-12}$	$5.6.10^{-12}$	$3.4.10^{-12}$	$2.8.10^{-12}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
	M	0.02	$4.3.10^{-11}$	0.01	$3.1.10^{-11}$	$1.5.10^{-11}$	$9.6.10^{-12}$	$6.5.10^{-12}$	$5.4.10^{-12}$
	S	0.02	$4.6.10^{-11}$	0.01	$3.3.10^{-11}$	$1.6.10^{-11}$	$1.0.10^{-11}$	$7.2.10^{-12}$	$5.9.10^{-12}$
Sb-125	F	0.2	$8.7.10^{-9}$	0.1	$6.8.10^{-9}$	$3.7.10^{-9}$	$2.3.10^{-9}$	$1.5.10^{-9}$	$1.4.10^{-9}$
	M	0.02	$2.0.10^{-8}$	0.01	$1.6.10^{-8}$	$1.0.10^{-8}$	$6.8.10^{-9}$	$5.8.10^{-9}$	$4.8.10^{-9}$
	S	0.02	$4.2.10^{-8}$	0.01	$3.8.10^{-8}$	$2.4.10^{-8}$	$1.6.10^{-8}$	$1.4.10^{-8}$	$1.2.10^{-8}$
Sb-126	F	0.2	$8.8.10^{-9}$	0.1	$6.6.10^{-9}$	$3.3.10^{-9}$	$2.1.10^{-9}$	$1.2.10^{-9}$	$1.0.10^{-9}$
	M	0.02	$1.7.10^{-8}$	0.01	$1.3.10^{-8}$	$7.4.10^{-9}$	$5.1.10^{-9}$	$3.5.10^{-9}$	$2.8.10^{-9}$
	S	0.02	$1.9.10^{-8}$	0.01	$1.5.10^{-8}$	$8.2.10^{-9}$	$5.0.10^{-9}$	$4.0.10^{-9}$	$3.2.10^{-9}$
Sb-126m	F	0.2	$1.2.10^{-10}$	0.1	$8.2.10^{-11}$	$3.8.10^{-11}$	$2.4.10^{-11}$	$1.5.10^{-11}$	$1.2.10^{-11}$
	M	0.02	$1.7.10^{-10}$	0.01	$1.2.10^{-10}$	$5.5.10^{-11}$	$3.5.10^{-11}$	$2.3.10^{-11}$	$1.9.10^{-11}$
	S	0.02	$1.8.10^{-10}$	0.01	$1.2.10^{-10}$	$5.7.10^{-11}$	$3.7.10^{-11}$	$2.4.10^{-11}$	$2.0.10^{-11}$
Sb-127	F	0.2	$5.1.10^{-9}$	0.1	$3.5.10^{-9}$	$1.6.10^{-9}$	$9.7.10^{-10}$	$5.2.10^{-10}$	$4.3.10^{-10}$
	M	0.02	$1.0.10^{-8}$	0.01	$7.3.10^{-9}$	$3.9.10^{-9}$	$2.7.10^{-9}$	$2.1.10^{-9}$	$1.7.10^{-9}$
	S	0.02	$1.1.10^{-8}$	0.01	$7.9.10^{-9}$	$4.2.10^{-9}$	$3.0.10^{-9}$	$2.3.10^{-9}$	$1.9.10^{-9}$
Sb-128	F	0.2	$2.1.10^{-9}$	0.1	$1.7.10^{-9}$	$8.3.10^{-10}$	$5.1.10^{-10}$	$2.9.10^{-10}$	$2.3.10^{-10}$
	M	0.02	$3.3.10^{-9}$	0.01	$2.5.10^{-9}$	$1.2.10^{-9}$	$7.9.10^{-10}$	$5.0.10^{-10}$	$4.0.10^{-10}$
	S	0.02	$3.4.10^{-9}$	0.01	$2.6.10^{-9}$	$1.3.10^{-9}$	$8.3.10^{-10}$	$5.2.10^{-10}$	$4.2.10^{-10}$
Sb-128m	F	0.2	$9.8.10^{-11}$	0.1	$6.9.10^{-11}$	$3.2.10^{-11}$	$2.0.10^{-11}$	$1.2.10^{-11}$	$1.0.10^{-11}$
	M	0.02	$1.3.10^{-10}$	0.01	$9.2.10^{-11}$	$4.3.10^{-11}$	$2.7.10^{-11}$	$1.7.10^{-11}$	$1.4.10^{-11}$
	S	0.02	$1.4.10^{-10}$	0.01	$9.4.10^{-11}$	$4.4.10^{-11}$	$2.8.10^{-11}$	$1.8.10^{-11}$	$1.5.10^{-11}$
Sb-129	F	0.2	$1.1.10^{-9}$	0.1	$8.2.10^{-10}$	$3.8.10^{-10}$	$2.3.10^{-10}$	$1.3.10^{-10}$	$1.0.10^{-10}$
	M	0.02	$2.0.10^{-9}$	0.01	$1.4.10^{-9}$	$6.8.10^{-10}$	$4.4.10^{-10}$	$2.9.10^{-10}$	$2.3.10^{-10}$
	S	0.02	$2.1.10^{-9}$	0.01	$1.5.10^{-9}$	$7.2.10^{-10}$	$4.6.10^{-10}$	$3.0.10^{-10}$	$2.5.10^{-10}$
Sb-130	F	0.2	$3.0.10^{-10}$	0.1	$2.2.10^{-10}$	$1.1.10^{-10}$	$6.6.10^{-11}$	$4.0.10^{-11}$	$3.3.10^{-11}$
	M	0.02	$4.5.10^{-10}$	0.01	$3.2.10^{-10}$	$1.6.10^{-10}$	$9.8.10^{-11}$	$6.3.10^{-11}$	$5.1.10^{-11}$
	S	0.02	$4.6.10^{-10}$	0.01	$3.3.10^{-10}$	$1.6.10^{-10}$	$1.0.10^{-10}$	$6.5.10^{-11}$	$5.3.10^{-11}$
Sb-131	F	0.2	$3.5.10^{-10}$	0.1	$2.8.10^{-10}$	$1.4.10^{-10}$	$7.7.10^{-11}$	$4.6.10^{-11}$	$3.5.10^{-11}$
	M	0.02	$3.9.10^{-10}$	0.01	$2.6.10^{-10}$	$1.3.10^{-10}$	$8.0.10^{-11}$	$5.3.10^{-11}$	$4.4.10^{-11}$
	S	0.02	$3.8.10^{-10}$	0.01	$2.6.10^{-10}$	$1.2.10^{-10}$	$7.9.10^{-11}$	$5.3.10^{-11}$	$4.4.10^{-11}$
tellurium									
Te-116	F	0.6	$5.3.10^{-10}$	0.3	$4.2.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$7.2.10^{-11}$	$5.8.10^{-11}$
	M	0.2	$8.6.10^{-10}$	0.1	$6.4.10^{-10}$	$3.2.10^{-10}$	$2.0.10^{-10}$	$1.3.10^{-10}$	$1.0.10^{-10}$
	S	0.02	$9.1.10^{-10}$	0.01	$6.7.10^{-10}$	$3.3.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
Te-121	F	0.6	$1.7.10^{-9}$	0.3	$1.4.10^{-9}$	$7.2.10^{-10}$	$4.6.10^{-10}$	$2.9.10^{-10}$	$2.4.10^{-10}$
	M	0.2	$2.3.10^{-9}$	0.1	$1.9.10^{-9}$	$1.0.10^{-9}$	$6.8.10^{-10}$	$4.7.10^{-10}$	$3.8.10^{-10}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
	S	0.02	$2.4.10^{-9}$	0.01	$2.0.10^{-9}$	$1.1.10^{-9}$	$7.2.10^{-10}$	$5.1.10^{-10}$	$4.1.10^{-10}$
Te-121m	F	0.6	$1.4.10^{-8}$	0.3	$1.0.10^{-8}$	$5.3.10^{-9}$	$3.3.10^{-9}$	$2.1.10^{-9}$	$1.8.10^{-9}$
	M	0.2	$1.9.10^{-8}$	0.1	$1.5.10^{-8}$	$8.8.10^{-9}$	$6.1.10^{-9}$	$5.1.10^{-9}$	$4.2.10^{-9}$
	S	0.02	$2.3.10^{-8}$	0.01	$1.9.10^{-8}$	$1.2.10^{-8}$	$8.1.10^{-9}$	$6.9.10^{-9}$	$5.7.10^{-9}$
Te-123	F	0.6	$1.1.10^{-8}$	0.3	$9.1.10^{-9}$	$6.2.10^{-9}$	$4.8.10^{-9}$	$4.0.10^{-9}$	$3.9.10^{-9}$
	M	0.2	$5.6.10^{-9}$	0.1	$4.4.10^{-9}$	$3.0.10^{-9}$	$2.3.10^{-9}$	$2.0.10^{-9}$	$1.9.10^{-9}$
	S	0.02	$5.3.10^{-9}$	0.01	$5.0.10^{-9}$	$3.5.10^{-9}$	$2.4.10^{-9}$	$2.1.10^{-9}$	$2.0.10^{-9}$
Te-123m	F	0.6	$9.8.10^{-9}$	0.3	$6.8.10^{-9}$	$3.4.10^{-9}$	$1.9.10^{-9}$	$1.1.10^{-9}$	$9.5.10^{-10}$
	M	0.2	$1.8.10^{-8}$	0.1	$1.3.10^{-8}$	$8.0.10^{-9}$	$5.7.10^{-9}$	$5.0.10^{-9}$	$4.0.10^{-9}$
	S	0.02	$2.0.10^{-8}$	0.01	$1.6.10^{-8}$	$9.8.10^{-9}$	$7.1.10^{-9}$	$6.3.10^{-9}$	$5.1.10^{-9}$
Te-125m	F	0.6	$6.2.10^{-9}$	0.3	$4.2.10^{-9}$	$2.0.10^{-9}$	$1.1.10^{-9}$	$6.1.10^{-10}$	$5.1.10^{-10}$
	M	0.2	$1.5.10^{-8}$	0.1	$1.1.10^{-8}$	$6.6.10^{-9}$	$4.8.10^{-9}$	$4.3.10^{-9}$	$3.4.10^{-9}$
	S	0.02	$1.7.10^{-8}$	0.01	$1.3.10^{-8}$	$7.8.10^{-9}$	$5.8.10^{-9}$	$5.3.10^{-9}$	$4.2.10^{-9}$
Te-127	F	0.6	$4.3.10^{-10}$	0.3	$3.2.10^{-10}$	$1.4.10^{-10}$	$8.5.10^{-11}$	$4.5.10^{-11}$	$3.9.10^{-11}$
	M	0.2	$1.0.10^{-9}$	0.1	$7.3.10^{-10}$	$3.6.10^{-10}$	$2.4.10^{-10}$	$1.6.10^{-10}$	$1.3.10^{-10}$
	S	0.02	$1.2.10^{-9}$	0.01	$7.9.10^{-10}$	$3.9.10^{-10}$	$2.6.10^{-10}$	$1.7.10^{-10}$	$1.4.10^{-10}$
Te-127m	F	0.6	$2.1.10^{-8}$	0.3	$1.4.10^{-8}$	$6.5.10^{-9}$	$3.5.10^{-9}$	$2.0.10^{-9}$	$1.5.10^{-9}$
	M	0.2	$3.5.10^{-8}$	0.1	$2.6.10^{-8}$	$1.5.10^{-8}$	$1.1.10^{-8}$	$9.2.10^{-9}$	$7.4.10^{-9}$
	S	0.02	$4.1.10^{-8}$	0.01	$3.3.10^{-8}$	$2.0.10^{-8}$	$1.4.10^{-8}$	$1.2.10^{-8}$	$9.8.10^{-9}$
Te-129	F	0.6	$1.8.10^{-10}$	0.3	$1.2.10^{-10}$	$5.1.10^{-11}$	$3.2.10^{-11}$	$1.9.10^{-11}$	$1.6.10^{-11}$
	M	0.2	$3.3.10^{-10}$	0.1	$2.2.10^{-10}$	$9.9.10^{-11}$	$6.5.10^{-11}$	$4.4.10^{-11}$	$3.7.10^{-11}$
	S	0.02	$3.5.10^{-10}$	0.01	$2.3.10^{-10}$	$1.0.10^{-10}$	$6.9.10^{-11}$	$4.7.10^{-11}$	$3.9.10^{-11}$
Te-129m	F	0.6	$2.0.10^{-8}$	0.3	$1.3.10^{-8}$	$5.8.10^{-9}$	$3.1.10^{-9}$	$1.7.10^{-9}$	$1.3.10^{-9}$
	M	0.2	$3.5.10^{-8}$	0.1	$2.6.10^{-8}$	$1.4.10^{-8}$	$9.8.10^{-9}$	$8.0.10^{-9}$	$6.6.10^{-9}$
	S	0.02	$3.8.10^{-8}$	0.01	$2.9.10^{-8}$	$1.7.10^{-8}$	$1.2.10^{-8}$	$9.6.10^{-9}$	$7.9.10^{-9}$
Te-131	F	0.6	$2.3.10^{-10}$	0.3	$2.0.10^{-10}$	$9.9.10^{-11}$	$5.3.10^{-11}$	$3.3.10^{-11}$	$2.3.10^{-11}$
	M	0.2	$2.6.10^{-10}$	0.1	$1.7.10^{-10}$	$8.1.10^{-11}$	$5.2.10^{-11}$	$3.5.10^{-11}$	$2.8.10^{-11}$
	S	0.02	$2.4.10^{-10}$	0.01	$1.6.10^{-10}$	$7.4.10^{-11}$	$4.9.10^{-11}$	$3.3.10^{-11}$	$2.8.10^{-11}$
Te-131m	F	0.6	$8.7.10^{-9}$	0.3	$7.6.10^{-9}$	$3.9.10^{-9}$	$2.0.10^{-9}$	$1.2.10^{-9}$	$8.6.10^{-10}$
	M	0.2	$7.9.10^{-9}$	0.1	$5.8.10^{-9}$	$3.0.10^{-9}$	$1.9.10^{-9}$	$1.2.10^{-9}$	$9.4.10^{-10}$
	S	0.02	$7.0.10^{-9}$	0.01	$5.1.10^{-9}$	$2.6.10^{-9}$	$1.8.10^{-9}$	$1.1.10^{-9}$	$9.1.10^{-10}$
Te-132	F	0.6	$2.2.10^{-8}$	0.3	$1.8.10^{-8}$	$8.5.10^{-9}$	$4.2.10^{-9}$	$2.6.10^{-9}$	$1.8.10^{-9}$
	M	0.2	$1.6.10^{-8}$	0.1	$1.3.10^{-8}$	$6.4.10^{-9}$	$4.0.10^{-9}$	$2.6.10^{-9}$	$2.0.10^{-9}$
	S	0.02	$1.5.10^{-8}$	0.01	$1.1.10^{-8}$	$5.8.10^{-9}$	$3.8.10^{-9}$	$2.5.10^{-9}$	$2.0.10^{-9}$
Te-133	F	0.6	$2.4.10^{-10}$	0.3	$2.1.10^{-10}$	$9.6.10^{-11}$	$4.6.10^{-11}$	$2.8.10^{-11}$	$1.9.10^{-11}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
	M	0.2	$2.0.10^{-10}$	0.1	$1.3.10^{-10}$	$6.1.10^{-11}$	$3.8.10^{-11}$	$2.4.10^{-11}$	$2.0.10^{-11}$
	S	0.02	$1.7.10^{-10}$	0.01	$1.2.10^{-10}$	$5.4.10^{-11}$	$3.5.10^{-11}$	$2.2.10^{-11}$	$1.9.10^{-11}$
Te-133m	F	0.6	$1.0.10^{-9}$	0.3	$8.9.10^{-10}$	$4.1.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$8.1.10^{-11}$
	M	0.2	$8.5.10^{-10}$	0.1	$5.8.10^{-10}$	$2.8.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$8.7.10^{-11}$
	S	0.02	$7.4.10^{-10}$	0.01	$5.1.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$	$1.0.10^{-10}$	$8.4.10^{-11}$
Te-134	F	0.6	$4.7.10^{-10}$	0.3	$3.7.10^{-10}$	$1.8.10^{-10}$	$1.0.10^{-10}$	$6.0.10^{-11}$	$4.7.10^{-11}$
	M	0.2	$5.5.10^{-10}$	0.1	$3.9.10^{-10}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$8.1.10^{-11}$	$6.6.10^{-11}$
	S	0.02	$5.6.10^{-10}$	0.01	$4.0.10^{-10}$	$1.9.10^{-10}$	$1.3.10^{-10}$	$8.4.10^{-11}$	$6.8.10^{-11}$
iodine									
I-120	F	1.0	$1.3.10^{-9}$	1.0	$1.0.10^{-9}$	$4.8.10^{-10}$	$2.3.10^{-10}$	$1.4.10^{-10}$	$1.0.10^{-10}$
	M	0.2	$1.1.10^{-9}$	0.1	$7.3.10^{-10}$	$3.4.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$1.0.10^{-10}$
	S	0.02	$1.0.10^{-9}$	0.01	$6.9.10^{-10}$	$3.2.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$1.0.10^{-10}$
I-120m	F	1.0	$8.6.10^{-10}$	1.0	$6.9.10^{-10}$	$3.3.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$8.2.10^{-11}$
	M	0.2	$8.2.10^{-10}$	0.1	$5.9.10^{-10}$	$2.9.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$8.7.10^{-11}$
	S	0.02	$8.2.10^{-10}$	0.01	$5.8.10^{-10}$	$2.8.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$8.8.10^{-11}$
I-121	F	1.0	$2.3.10^{-10}$	1.0	$2.1.10^{-10}$	$1.1.10^{-10}$	$6.0.10^{-11}$	$3.8.10^{-11}$	$2.7.10^{-11}$
	M	0.2	$2.1.10^{-10}$	0.1	$1.5.10^{-10}$	$7.8.10^{-11}$	$4.9.10^{-11}$	$3.2.10^{-11}$	$2.5.10^{-11}$
	S	0.02	$1.9.10^{-10}$	0.01	$1.4.10^{-10}$	$7.0.10^{-11}$	$4.5.10^{-11}$	$3.0.10^{-11}$	$2.4.10^{-11}$
I-123	F	1.0	$8.7.10^{-10}$	1.0	$7.9.10^{-10}$	$3.8.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$7.4.10^{-11}$
	M	0.2	$5.3.10^{-10}$	0.1	$3.9.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$8.2.10^{-11}$	$6.4.10^{-11}$
	S	0.02	$4.3.10^{-10}$	0.01	$3.2.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$7.6.10^{-11}$	$6.0.10^{-11}$
I-124	F	1.0	$4.7.10^{-8}$	1.0	$4.5.10^{-8}$	$2.2.10^{-8}$	$1.1.10^{-8}$	$6.7.10^{-9}$	$4.4.10^{-9}$
	M	0.2	$1.4.10^{-8}$	0.1	$9.3.10^{-9}$	$4.6.10^{-9}$	$2.5.10^{-9}$	$1.6.10^{-9}$	$1.2.10^{-9}$
	S	0.02	$6.2.10^{-9}$	0.01	$4.4.10^{-9}$	$2.2.10^{-9}$	$1.4.10^{-9}$	$9.4.10^{-10}$	$7.7.10^{-10}$
I-125	F	1.0	$2.0.10^{-8}$	1.0	$2.3.10^{-8}$	$1.5.10^{-8}$	$1.1.10^{-8}$	$7.2.10^{-9}$	$5.1.10^{-9}$
	M	0.2	$6.9.10^{-9}$	0.1	$5.6.10^{-9}$	$3.6.10^{-9}$	$2.6.10^{-9}$	$1.8.10^{-9}$	$1.4.10^{-9}$
	S	0.02	$2.4.10^{-9}$	0.01	$1.8.10^{-9}$	$1.0.10^{-9}$	$6.7.10^{-10}$	$4.8.10^{-10}$	$3.8.10^{-10}$
I-126	F	1.0	$8.1.10^{-8}$	1.0	$8.3.10^{-8}$	$4.5.10^{-8}$	$2.4.10^{-8}$	$1.5.10^{-8}$	$9.8.10^{-9}$
	M	0.2	$2.4.10^{-8}$	0.1	$1.7.10^{-8}$	$9.5.10^{-9}$	$5.5.10^{-9}$	$3.8.10^{-9}$	$2.7.10^{-9}$
	S	0.02	$8.3.10^{-9}$	0.01	$5.9.10^{-9}$	$3.3.10^{-9}$	$2.2.10^{-9}$	$1.8.10^{-9}$	$1.4.10^{-9}$
I-128	F	1.0	$1.5.10^{-10}$	1.0	$1.1.10^{-10}$	$4.7.10^{-11}$	$2.7.10^{-11}$	$1.6.10^{-11}$	$1.3.10^{-11}$
	M	0.2	$1.9.10^{-10}$	0.1	$1.2.10^{-10}$	$5.3.10^{-11}$	$3.4.10^{-11}$	$2.2.10^{-11}$	$1.9.10^{-11}$
	S	0.02	$1.9.10^{-10}$	0.01	$1.2.10^{-10}$	$5.4.10^{-11}$	$3.5.10^{-11}$	$2.3.10^{-11}$	$2.0.10^{-11}$
I-129	F	1.0	$7.2.10^{-8}$	1.0	$8.6.10^{-8}$	$6.1.10^{-8}$	$6.7.10^{-8}$	$4.6.10^{-8}$	$3.6.10^{-8}$
	M	0.2	$3.6.10^{-8}$	0.1	$3.3.10^{-8}$	$2.4.10^{-8}$	$2.4.10^{-8}$	$1.9.10^{-8}$	$1.5.10^{-8}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
	S	0.02	$2.9.10^{-8}$	0.01	$2.6.10^{-8}$	$1.8.10^{-8}$	$1.3.10^{-8}$	$1.1.10^{-8}$	$9.8.10^{-9}$
I-130	F	1.0	$8.2.10^{-9}$	1.0	$7.4.10^{-9}$	$3.5.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$6.7.10^{-10}$
	M	0.2	$4.3.10^{-9}$	0.1	$3.1.10^{-9}$	$1.5.10^{-9}$	$9.2.10^{-10}$	$5.8.10^{-10}$	$4.5.10^{-10}$
	S	0.02	$3.3.10^{-9}$	0.01	$2.4.10^{-9}$	$1.2.10^{-9}$	$7.9.10^{-10}$	$5.1.10^{-10}$	$4.1.10^{-10}$
I-131	F	1.0	$7.2.10^{-8}$	1.0	$7.2.10^{-8}$	$3.7.10^{-8}$	$1.9.10^{-8}$	$1.1.10^{-8}$	$7.4.10^{-9}$
	M	0.2	$2.2.10^{-8}$	0.1	$1.5.10^{-8}$	$8.2.10^{-9}$	$4.7.10^{-9}$	$3.4.10^{-9}$	$2.4.10^{-9}$
	S	0.02	$8.8.10^{-9}$	0.01	$6.2.10^{-9}$	$3.5.10^{-9}$	$2.4.10^{-9}$	$2.0.10^{-9}$	$1.6.10^{-9}$
I-132	F	1.0	$1.1.10^{-9}$	1.0	$9.6.10^{-10}$	$4.5.10^{-10}$	$2.2.10^{-10}$	$1.3.10^{-10}$	$9.4.10^{-11}$
	M	0.2	$9.9.10^{-10}$	0.1	$7.3.10^{-10}$	$3.6.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
	S	0.02	$9.3.10^{-10}$	0.01	$6.8.10^{-10}$	$3.4.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
I-132m	F	1.0	$9.6.10^{-10}$	1.0	$8.4.10^{-10}$	$4.0.10^{-10}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$7.9.10^{-11}$
	M	0.2	$7.2.10^{-10}$	0.1	$5.3.10^{-10}$	$2.6.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$8.7.10^{-11}$
	S	0.02	$6.6.10^{-10}$	0.01	$4.8.10^{-10}$	$2.4.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$8.5.10^{-11}$
I-133	F	1.0	$1.9.10^{-8}$	1.0	$1.8.10^{-8}$	$8.3.10^{-9}$	$3.8.10^{-9}$	$2.2.10^{-9}$	$1.5.10^{-9}$
	M	0.2	$6.6.10^{-9}$	0.1	$4.4.10^{-9}$	$2.1.10^{-9}$	$1.2.10^{-9}$	$7.4.10^{-10}$	$5.5.10^{-10}$
	S	0.02	$3.8.10^{-9}$	0.01	$2.9.10^{-9}$	$1.4.10^{-9}$	$9.0.10^{-10}$	$5.3.10^{-10}$	$4.3.10^{-10}$
I-134	F	1.0	$4.6.10^{-10}$	1.0	$3.7.10^{-10}$	$1.8.10^{-10}$	$9.7.10^{-11}$	$5.9.10^{-11}$	$4.5.10^{-11}$
	M	0.2	$4.8.10^{-10}$	0.1	$3.4.10^{-10}$	$1.7.10^{-10}$	$1.0.10^{-10}$	$6.7.10^{-11}$	$5.4.10^{-11}$
	S	0.02	$4.8.10^{-10}$	0.01	$3.4.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$6.8.10^{-11}$	$5.5.10^{-11}$
I-135	F	1.0	$4.1.10^{-9}$	1.0	$3.7.10^{-9}$	$1.7.10^{-9}$	$7.9.10^{-10}$	$4.8.10^{-10}$	$3.2.10^{-10}$
	M	0.2	$2.2.10^{-9}$	0.1	$1.6.10^{-9}$	$7.8.10^{-10}$	$4.7.10^{-10}$	$3.0.10^{-10}$	$2.4.10^{-10}$
	S	0.02	$1.8.10^{-9}$	0.01	$1.3.10^{-9}$	$6.5.10^{-10}$	$4.2.10^{-10}$	$2.7.10^{-10}$	$2.2.10^{-10}$
caesium									
Cs-125	F	1.0	$1.2.10^{-10}$	1.0	$8.3.10^{-11}$	$3.9.10^{-11}$	$2.4.10^{-11}$	$1.4.10^{-11}$	$1.2.10^{-11}$
	M	0.2	$2.0.10^{-10}$	0.1	$1.4.10^{-10}$	$6.5.10^{-11}$	$4.2.10^{-11}$	$2.7.10^{-11}$	$2.2.10^{-11}$
	S	0.02	$2.1.10^{-10}$	0.01	$1.4.10^{-10}$	$6.8.10^{-11}$	$4.4.10^{-11}$	$2.8.10^{-11}$	$2.3.10^{-11}$
Cs-127	F	1.0	$1.6.10^{-10}$	1.0	$1.3.10^{-10}$	$6.9.10^{-11}$	$4.2.10^{-11}$	$2.5.10^{-11}$	$2.0.10^{-11}$
	M	0.2	$2.8.10^{-10}$	0.1	$2.2.10^{-10}$	$1.1.10^{-10}$	$7.3.10^{-11}$	$4.6.10^{-11}$	$3.6.10^{-11}$
	S	0.02	$3.0.10^{-10}$	0.01	$2.3.10^{-10}$	$1.2.10^{-10}$	$7.6.10^{-11}$	$4.8.10^{-11}$	$3.8.10^{-11}$
Cs-129	F	1.0	$3.4.10^{-10}$	1.0	$2.8.10^{-10}$	$1.4.10^{-10}$	$8.7.10^{-11}$	$5.2.10^{-11}$	$4.2.10^{-11}$
	M	0.2	$5.7.10^{-10}$	0.1	$4.6.10^{-10}$	$2.4.10^{-10}$	$1.5.10^{-10}$	$9.1.10^{-11}$	$7.3.10^{-11}$
	S	0.02	$6.3.10^{-10}$	0.01	$4.9.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$	$9.7.10^{-11}$	$7.7.10^{-11}$
Cs-130	F	1.0	$8.3.10^{-11}$	1.0	$5.6.10^{-11}$	$2.5.10^{-11}$	$1.6.10^{-11}$	$9.4.10^{-12}$	$7.8.10^{-12}$
	M	0.2	$1.3.10^{-10}$	0.1	$8.7.10^{-11}$	$4.0.10^{-11}$	$2.5.10^{-11}$	$1.6.10^{-11}$	$1.4.10^{-11}$
	S	0.02	$1.4.10^{-10}$	0.01	$9.0.10^{-11}$	$4.1.10^{-11}$	$2.6.10^{-11}$	$1.7.10^{-11}$	$1.4.10^{-11}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Cs-131	F	1.0	$2.4.10^{-10}$	1.0	$1.7.10^{-10}$	$8.4.10^{-11}$	$5.3.10^{-11}$	$3.2.10^{-11}$	$2.7.10^{-11}$
	M	0.2	$3.5.10^{-10}$	0.1	$2.6.10^{-10}$	$1.4.10^{-10}$	$8.5.10^{-11}$	$5.5.10^{-11}$	$4.4.10^{-11}$
	S	0.02	$3.8.10^{-10}$	0.01	$2.8.10^{-10}$	$1.4.10^{-10}$	$9.1.10^{-11}$	$5.9.10^{-11}$	$4.7.10^{-11}$
Cs-132	F	1.0	$1.5.10^{-9}$	1.0	$1.2.10^{-9}$	$6.4.10^{-10}$	$4.1.10^{-10}$	$2.7.10^{-10}$	$2.3.10^{-10}$
	M	0.2	$1.9.10^{-9}$	0.1	$1.5.10^{-9}$	$8.4.10^{-10}$	$5.4.10^{-10}$	$3.7.10^{-10}$	$2.9.10^{-10}$
	S	0.02	$2.0.10^{-9}$	0.01	$1.6.10^{-9}$	$8.7.10^{-10}$	$5.6.10^{-10}$	$3.8.10^{-10}$	$3.0.10^{-10}$
Cs-134	F	1.0	$1.1.10^{-8}$	1.0	$7.3.10^{-9}$	$5.2.10^{-9}$	$5.3.10^{-9}$	$6.3.10^{-9}$	$6.6.10^{-9}$
	M	0.2	$3.2.10^{-8}$	0.1	$2.6.10^{-8}$	$1.6.10^{-8}$	$1.2.10^{-8}$	$1.1.10^{-8}$	$9.1.10^{-9}$
	S	0.02	$7.0.10^{-8}$	0.01	$6.3.10^{-8}$	$4.1.10^{-8}$	$2.8.10^{-8}$	$2.3.10^{-8}$	$2.0.10^{-8}$
Cs-134m	F	1.0	$1.3.10^{-10}$	1.0	$8.6.10^{-11}$	$3.8.10^{-11}$	$2.5.10^{-11}$	$1.6.10^{-11}$	$1.4.10^{-11}$
	M	0.2	$3.3.10^{-10}$	0.1	$2.3.10^{-10}$	$1.2.10^{-10}$	$8.3.10^{-11}$	$6.6.10^{-11}$	$5.4.10^{-11}$
	S	0.02	$3.6.10^{-10}$	0.01	$2.5.10^{-10}$	$1.3.10^{-10}$	$9.2.10^{-11}$	$7.4.10^{-11}$	$6.0.10^{-11}$
Cs-135	F	1.0	$1.7.10^{-9}$	1.0	$9.9.10^{-10}$	$6.2.10^{-10}$	$6.1.10^{-10}$	$6.8.10^{-10}$	$6.9.10^{-10}$
	M	0.2	$1.2.10^{-8}$	0.1	$9.3.10^{-9}$	$5.7.10^{-9}$	$4.1.10^{-9}$	$3.8.10^{-9}$	$3.1.10^{-9}$
	S	0.02	$2.7.10^{-8}$	0.01	$2.4.10^{-8}$	$1.6.10^{-8}$	$1.1.10^{-8}$	$9.5.10^{-9}$	$8.6.10^{-9}$
Cs-135m	F	1.0	$9.2.10^{-11}$	1.0	$7.8.10^{-11}$	$4.1.10^{-11}$	$2.4.10^{-11}$	$1.5.10^{-11}$	$1.2.10^{-11}$
	M	0.2	$1.2.10^{-10}$	0.1	$9.9.10^{-11}$	$5.2.10^{-11}$	$3.2.10^{-11}$	$1.9.10^{-11}$	$1.5.10^{-11}$
	S	0.02	$1.2.10^{-10}$	0.01	$1.0.10^{-10}$	$5.3.10^{-11}$	$3.3.10^{-11}$	$2.0.10^{-11}$	$1.6.10^{-11}$
Cs-136	F	1.0	$7.3.10^{-9}$	1.0	$5.2.10^{-9}$	$2.9.10^{-9}$	$2.0.10^{-9}$	$1.4.10^{-9}$	$1.2.10^{-9}$
	M	0.2	$1.3.10^{-8}$	0.1	$1.0.10^{-8}$	$6.0.10^{-9}$	$3.7.10^{-9}$	$3.1.10^{-9}$	$2.5.10^{-9}$
	S	0.02	$1.5.10^{-8}$	0.01	$1.1.10^{-8}$	$5.7.10^{-9}$	$4.1.10^{-9}$	$3.5.10^{-9}$	$2.8.10^{-9}$
Cs-137	F	1.0	$8.8.10^{-9}$	1.0	$5.4.10^{-9}$	$3.6.10^{-9}$	$3.7.10^{-9}$	$4.4.10^{-9}$	$4.6.10^{-9}$
	M	0.2	$3.6.10^{-8}$	0.1	$2.9.10^{-8}$	$1.8.10^{-8}$	$1.3.10^{-8}$	$1.1.10^{-8}$	$9.7.10^{-9}$
	S	0.02	$1.1.10^{-7}$	0.01	$1.0.10^{-7}$	$7.0.10^{-8}$	$4.8.10^{-8}$	$4.2.10^{-8}$	$3.9.10^{-8}$
Cs-138	F	1.0	$2.6.10^{-10}$	1.0	$1.8.10^{-10}$	$8.1.10^{-11}$	$5.0.10^{-11}$	$2.9.10^{-11}$	$2.4.10^{-11}$
	M	0.2	$4.0.10^{-10}$	0.1	$2.7.10^{-10}$	$1.3.10^{-10}$	$7.8.10^{-11}$	$4.9.10^{-11}$	$4.1.10^{-11}$
	S	0.02	$4.2.10^{-10}$	0.01	$2.8.10^{-10}$	$1.3.10^{-10}$	$8.2.10^{-11}$	$5.1.10^{-11}$	$4.3.10^{-11}$
barium									
Ba-126	F	0.6	$6.7.10^{-10}$	0.3**	$5.2.10^{-10}$	$2.4.10^{-10}$	$1.4.10^{-10}$	$6.9.10^{-11}$	$7.4.10^{-11}$
	M	0.2	$1.0.10^{-9}$	0.1	$7.0.10^{-10}$	$3.2.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$1.0.10^{-10}$
	S	0.02	$1.1.10^{-9}$	0.01	$7.2.10^{-10}$	$3.3.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$1.1.10^{-10}$
Ba-128	F	0.6	$5.9.10^{-9}$	0.3**	$5.4.10^{-9}$	$2.5.10^{-9}$	$1.4.10^{-9}$	$7.4.10^{-10}$	$7.6.10^{-10}$
	M	0.2	$1.1.10^{-8}$	0.1	$7.8.10^{-9}$	$3.7.10^{-9}$	$2.4.10^{-9}$	$1.5.10^{-9}$	$1.3.10^{-9}$
	S	0.02	$1.2.10^{-8}$	0.01	$8.3.10^{-9}$	$4.0.10^{-9}$	$2.6.10^{-9}$	$1.6.10^{-9}$	$1.4.10^{-9}$
Ba-131	F	0.6	$2.1.10^{-9}$	0.3**	$1.4.10^{-9}$	$7.1.10^{-10}$	$4.7.10^{-10}$	$3.1.10^{-10}$	$2.2.10^{-10}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
	M	0.2	$3.7.10^{-9}$	0.1	$3.1.10^{-9}$	$1.6.10^{-9}$	$1.1.10^{-9}$	$9.7.10^{-10}$	$7.6.10^{-10}$
	S	0.02	$4.0.10^{-9}$	0.01	$3.0.10^{-9}$	$1.8.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$	$8.7.10^{-10}$
Ba-131m	F	0.6	$2.7.10^{-11}$	0.3**	$2.1.10^{-11}$	$1.0.10^{-11}$	$6.7.10^{-12}$	$4.7.10^{-12}$	$4.0.10^{-12}$
	M	0.2	$4.8.10^{-11}$	0.1	$3.3.10^{-11}$	$1.7.10^{-11}$	$1.2.10^{-11}$	$9.0.10^{-12}$	$7.4.10^{-12}$
	S	0.02	$5.0.10^{-11}$	0.01	$3.5.10^{-11}$	$1.8.10^{-11}$	$1.2.10^{-11}$	$9.5.10^{-12}$	$7.8.10^{-12}$
Ba-133	F	0.6	$1.1.10^{-8}$	0.3**	$4.5.10^{-9}$	$2.6.10^{-9}$	$3.7.10^{-9}$	$6.0.10^{-9}$	$1.5.10^{-9}$
	M	0.2	$1.5.10^{-8}$	0.1	$1.0.10^{-8}$	$6.4.10^{-9}$	$5.1.10^{-9}$	$5.5.10^{-9}$	$3.1.10^{-9}$
	S	0.02	$3.2.10^{-8}$	0.01	$2.9.10^{-8}$	$2.0.10^{-8}$	$1.3.10^{-8}$	$1.1.10^{-8}$	$1.0.10^{-8}$
Ba-133m	F	0.6	$1.4.10^{-9}$	0.3**	$1.1.10^{-9}$	$4.9.10^{-10}$	$3.1.10^{-10}$	$1.5.10^{-10}$	$1.8.10^{-10}$
	M	0.2	$3.0.10^{-9}$	0.1	$2.2.10^{-9}$	$1.0.10^{-9}$	$6.9.10^{-10}$	$5.2.10^{-10}$	$4.2.10^{-10}$
	S	0.02	$3.1.10^{-9}$	0.01	$2.4.10^{-9}$	$1.1.10^{-9}$	$7.6.10^{-10}$	$5.8.10^{-10}$	$4.6.10^{-10}$
Ba-135m	F	0.6	$1.1.10^{-9}$	0.3**	$1.0.10^{-9}$	$4.6.10^{-10}$	$2.5.10^{-10}$	$1.2.10^{-10}$	$1.4.10^{-10}$
	M	0.2	$2.4.10^{-9}$	0.1	$1.8.10^{-9}$	$8.9.10^{-10}$	$5.4.10^{-10}$	$4.1.10^{-10}$	$3.3.10^{-10}$
	S	0.02	$2.7.10^{-9}$	0.01	$1.9.10^{-9}$	$8.6.10^{-10}$	$5.9.10^{-10}$	$4.5.10^{-10}$	$3.6.10^{-10}$
Ba-139	F	0.6	$3.3.10^{-10}$	0.3**	$2.4.10^{-10}$	$1.1.10^{-10}$	$6.0.10^{-11}$	$3.1.10^{-11}$	$3.4.10^{-11}$
	M	0.2	$5.4.10^{-10}$	0.1	$3.5.10^{-10}$	$1.6.10^{-10}$	$1.0.10^{-10}$	$6.6.10^{-11}$	$5.6.10^{-11}$
	S	0.02	$5.7.10^{-10}$	0.01	$3.6.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$7.0.10^{-11}$	$5.9.10^{-11}$
Ba-140	F	0.6	$1.4.10^{-8}$	0.3**	$7.8.10^{-9}$	$3.6.10^{-9}$	$2.4.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$
	M	0.2	$2.7.10^{-8}$	0.1	$2.0.10^{-8}$	$1.1.10^{-8}$	$7.6.10^{-9}$	$6.2.10^{-9}$	$5.1.10^{-9}$
	S	0.02	$2.9.10^{-8}$	0.01	$2.2.10^{-8}$	$1.2.10^{-8}$	$8.6.10^{-9}$	$7.1.10^{-9}$	$5.8.10^{-9}$
Ba-141	F	0.6	$1.9.10^{-10}$	0.3**	$1.4.10^{-10}$	$6.4.10^{-11}$	$3.8.10^{-11}$	$2.1.10^{-11}$	$2.1.10^{-11}$
	M	0.2	$3.0.10^{-10}$	0.1	$2.0.10^{-10}$	$9.3.10^{-11}$	$5.9.10^{-11}$	$3.8.10^{-11}$	$3.2.10^{-11}$
	S	0.02	$3.2.10^{-10}$	0.01	$2.1.10^{-10}$	$9.7.10^{-11}$	$6.2.10^{-11}$	$4.0.10^{-11}$	$3.4.10^{-11}$
Ba-142	F	0.6	$1.3.10^{-10}$	0.3**	$9.6.10^{-11}$	$4.5.10^{-11}$	$2.7.10^{-11}$	$1.6.10^{-11}$	$1.5.10^{-11}$
	M	0.2	$1.8.10^{-10}$	0.1	$1.3.10^{-10}$	$6.1.10^{-11}$	$3.9.10^{-11}$	$2.5.10^{-11}$	$2.1.10^{-11}$
	S	0.02	$1.9.10^{-10}$	0.01	$1.3.10^{-10}$	$6.2.10^{-11}$	$4.0.10^{-11}$	$2.6.10^{-11}$	$2.2.10^{-11}$
lanthanum									
La-131	F	0.005	$1.2.10^{-10}$	$5.0.10^{-4}$	$8.7.10^{-11}$	$4.2.10^{-11}$	$2.6.10^{-11}$	$1.5.10^{-11}$	$1.3.10^{-11}$
	M	0.005	$1.8.10^{-10}$	$5.0.10^{-4}$	$1.3.10^{-10}$	$6.4.10^{-11}$	$4.1.10^{-11}$	$2.8.10^{-11}$	$2.3.10^{-11}$
La-132	F	0.005	$1.0.10^{-9}$	$5.0.10^{-4}$	$7.7.10^{-10}$	$3.7.10^{-10}$	$2.2.10^{-10}$	$1.2.10^{-10}$	$1.0.10^{-10}$
	M	0.005	$1.5.10^{-9}$	$5.0.10^{-4}$	$1.1.10^{-9}$	$5.4.10^{-10}$	$3.4.10^{-10}$	$2.0.10^{-10}$	$1.6.10^{-10}$
La-135	F	0.005	$1.0.10^{-10}$	$5.0.10^{-4}$	$7.7.10^{-11}$	$3.8.10^{-11}$	$2.3.10^{-11}$	$1.3.10^{-11}$	$1.0.10^{-11}$
	M	0.005	$1.3.10^{-10}$	$5.0.10^{-4}$	$1.0.10^{-10}$	$4.9.10^{-11}$	$3.0.10^{-11}$	$1.7.10^{-11}$	$1.4.10^{-11}$
La-137	F	0.005	$2.5.10^{-8}$	$5.0.10^{-4}$	$2.3.10^{-8}$	$1.5.10^{-8}$	$1.1.10^{-8}$	$8.9.10^{-9}$	$8.7.10^{-9}$
	M	0.005	$8.6.10^{-9}$	$5.0.10^{-4}$	$8.1.10^{-9}$	$5.6.10^{-9}$	$4.0.10^{-9}$	$3.6.10^{-9}$	$3.6.10^{-9}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
La-138	F	0.005	$3.7.10^{-7}$	$5.0.10^{-4}$	$3.5.10^{-7}$	$2.4.10^{-7}$	$1.8.10^{-7}$	$1.6.10^{-7}$	$1.5.10^{-7}$
	M	0.005	$1.3.10^{-7}$	$5.0.10^{-4}$	$1.2.10^{-7}$	$9.1.10^{-8}$	$6.8.10^{-8}$	$6.4.10^{-8}$	$6.4.10^{-8}$
La-140	F	0.005	$5.8.10^{-9}$	$5.0.10^{-4}$	$4.2.10^{-9}$	$2.0.10^{-9}$	$1.2.10^{-9}$	$6.9.10^{-10}$	$5.7.10^{-10}$
	M	0.005	$8.8.10^{-9}$	$5.0.10^{-4}$	$6.3.10^{-9}$	$3.1.10^{-9}$	$2.0.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$
La-141	F	0.005	$8.6.10^{-10}$	$5.0.10^{-4}$	$5.5.10^{-10}$	$2.3.10^{-10}$	$1.4.10^{-10}$	$7.5.10^{-11}$	$6.3.10^{-11}$
	M	0.005	$1.4.10^{-9}$	$5.0.10^{-4}$	$9.3.10^{-10}$	$4.3.10^{-10}$	$2.8.10^{-10}$	$1.8.10^{-10}$	$1.5.10^{-10}$
La-142	F	0.005	$5.3.10^{-10}$	$5.0.10^{-4}$	$3.8.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$6.3.10^{-11}$	$5.2.10^{-11}$
	M	0.005	$8.1.10^{-10}$	$5.0.10^{-4}$	$5.7.10^{-10}$	$2.7.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$8.9.10^{-11}$
La-143	F	0.005	$1.4.10^{-10}$	$5.0.10^{-4}$	$8.6.10^{-11}$	$3.7.10^{-11}$	$2.3.10^{-11}$	$1.4.10^{-11}$	$1.2.10^{-11}$
	M	0.005	$2.1.10^{-10}$	$5.0.10^{-4}$	$1.3.10^{-10}$	$6.0.10^{-11}$	$3.9.10^{-11}$	$2.5.10^{-11}$	$2.1.10^{-11}$
cerium									
Ce-134	F	0.005	$7.6.10^{-9}$	$5.0.10^{-4}$	$5.3.10^{-9}$	$2.3.10^{-9}$	$1.4.10^{-9}$	$7.7.10^{-10}$	$5.7.10^{-10}$
	M	0.005	$1.1.10^{-8}$	$5.0.10^{-4}$	$7.6.10^{-9}$	$3.7.10^{-9}$	$2.4.10^{-9}$	$1.5.10^{-9}$	$1.3.10^{-9}$
	S	0.005	$1.2.10^{-8}$	$5.0.10^{-4}$	$8.0.10^{-9}$	$3.8.10^{-9}$	$2.5.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
Ce-135	F	0.005	$2.3.10^{-9}$	$5.0.10^{-4}$	$1.7.10^{-9}$	$8.5.10^{-10}$	$5.3.10^{-10}$	$3.0.10^{-10}$	$2.4.10^{-10}$
	M	0.005	$3.6.10^{-9}$	$5.0.10^{-4}$	$2.7.10^{-9}$	$1.4.10^{-9}$	$8.9.10^{-10}$	$5.9.10^{-10}$	$4.8.10^{-10}$
	S	0.005	$3.7.10^{-9}$	$5.0.10^{-4}$	$2.8.10^{-9}$	$1.4.10^{-9}$	$9.4.10^{-10}$	$6.3.10^{-10}$	$5.0.10^{-10}$
Ce-137	F	0.005	$7.5.10^{-11}$	$5.0.10^{-4}$	$5.6.10^{-11}$	$2.7.10^{-11}$	$1.6.10^{-11}$	$8.7.10^{-12}$	$7.0.10^{-12}$
	M	0.005	$1.1.10^{-10}$	$5.0.10^{-4}$	$7.6.10^{-11}$	$3.6.10^{-11}$	$2.2.10^{-11}$	$1.2.10^{-11}$	$9.8.10^{-12}$
	S	0.005	$1.1.10^{-10}$	$5.0.10^{-4}$	$7.8.10^{-11}$	$3.7.10^{-11}$	$2.3.10^{-11}$	$1.3.10^{-11}$	$1.0.10^{-11}$
Ce-137m	F	0.005	$1.6.10^{-9}$	$5.0.10^{-4}$	$1.1.10^{-9}$	$4.6.10^{-10}$	$2.8.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
	M	0.005	$3.1.10^{-9}$	$5.0.10^{-4}$	$2.2.10^{-9}$	$1.1.10^{-9}$	$6.7.10^{-10}$	$5.1.10^{-10}$	$4.1.10^{-10}$
	S	0.005	$3.3.10^{-9}$	$5.0.10^{-4}$	$2.3.10^{-9}$	$1.0.10^{-9}$	$7.3.10^{-10}$	$5.6.10^{-10}$	$4.4.10^{-10}$
Ce-139	F	0.005	$1.1.10^{-8}$	$5.0.10^{-4}$	$8.5.10^{-9}$	$4.5.10^{-9}$	$2.8.10^{-9}$	$1.8.10^{-9}$	$1.5.10^{-9}$
	M	0.005	$7.5.10^{-9}$	$5.0.10^{-4}$	$6.1.10^{-9}$	$3.6.10^{-9}$	$2.5.10^{-9}$	$2.1.10^{-9}$	$1.7.10^{-9}$
	S	0.005	$7.8.10^{-9}$	$5.0.10^{-4}$	$6.3.10^{-9}$	$3.9.10^{-9}$	$2.7.10^{-9}$	$2.4.10^{-9}$	$1.9.10^{-9}$
Ce-141	F	0.005	$1.1.10^{-8}$	$5.0.10^{-4}$	$7.3.10^{-9}$	$3.5.10^{-9}$	$2.0.10^{-9}$	$1.2.10^{-9}$	$9.3.10^{-10}$
	M	0.005	$1.4.10^{-8}$	$5.0.10^{-4}$	$1.1.10^{-8}$	$6.3.10^{-9}$	$4.6.10^{-9}$	$4.1.10^{-9}$	$3.2.10^{-9}$
	S	0.005	$1.6.10^{-8}$	$5.0.10^{-4}$	$1.2.10^{-8}$	$7.1.10^{-9}$	$5.3.10^{-9}$	$4.8.10^{-9}$	$3.8.10^{-9}$
Ce-143	F	0.005	$3.6.10^{-9}$	$5.0.10^{-4}$	$2.3.10^{-9}$	$1.0.10^{-9}$	$6.2.10^{-10}$	$3.3.10^{-10}$	$2.7.10^{-10}$
	M	0.005	$5.6.10^{-9}$	$5.0.10^{-4}$	$3.9.10^{-9}$	$1.9.10^{-9}$	$1.3.10^{-9}$	$9.3.10^{-10}$	$7.5.10^{-10}$
	S	0.005	$5.9.10^{-9}$	$5.0.10^{-4}$	$4.1.10^{-9}$	$2.1.10^{-9}$	$1.4.10^{-9}$	$1.0.10^{-9}$	$8.3.10^{-10}$
Ce-144	F	0.005	$3.6.10^{-7}$	$5.0.10^{-4}$	$2.7.10^{-7}$	$1.4.10^{-7}$	$7.8.10^{-8}$	$4.8.10^{-8}$	$4.0.10^{-8}$
	M	0.005	$1.9.10^{-7}$	$5.0.10^{-4}$	$1.6.10^{-7}$	$8.8.10^{-8}$	$5.5.10^{-8}$	$4.1.10^{-8}$	$3.6.10^{-8}$
	S	0.005	$2.1.10^{-7}$	$5.0.10^{-4}$	$1.8.10^{-7}$	$1.1.10^{-7}$	$7.3.10^{-8}$	$5.8.10^{-8}$	$5.3.10^{-8}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
praseodymium									
Pr-136	M	0.005	$1.3.10^{-10}$	$5.0.10^{-4}$	$8.8.10^{-11}$	$4.2.10^{-11}$	$2.6.10^{-11}$	$1.6.10^{-11}$	$1.3.10^{-11}$
	S	0.005	$1.3.10^{-10}$	$5.0.10^{-4}$	$9.0.10^{-11}$	$4.3.10^{-11}$	$2.7.10^{-11}$	$1.7.10^{-11}$	$1.4.10^{-11}$
Pr-137	M	0.005	$1.8.10^{-10}$	$5.0.10^{-4}$	$1.3.10^{-10}$	$6.1.10^{-11}$	$3.9.10^{-11}$	$2.4.10^{-11}$	$2.0.10^{-11}$
	S	0.005	$1.9.10^{-10}$	$5.0.10^{-4}$	$1.3.10^{-10}$	$6.4.10^{-11}$	$4.0.10^{-11}$	$2.5.10^{-11}$	$2.1.10^{-11}$
Pr-138m	M	0.005	$5.9.10^{-10}$	$5.0.10^{-4}$	$4.5.10^{-10}$	$2.3.10^{-10}$	$1.4.10^{-10}$	$9.0.10^{-11}$	$7.2.10^{-11}$
	S	0.005	$6.0.10^{-10}$	$5.0.10^{-4}$	$4.7.10^{-10}$	$2.4.10^{-10}$	$1.5.10^{-10}$	$9.3.10^{-11}$	$7.4.10^{-11}$
Pr-139	M	0.005	$1.5.10^{-10}$	$5.0.10^{-4}$	$1.1.10^{-10}$	$5.5.10^{-11}$	$3.5.10^{-11}$	$2.3.10^{-11}$	$1.8.10^{-11}$
	S	0.005	$1.6.10^{-10}$	$5.0.10^{-4}$	$1.2.10^{-10}$	$5.7.10^{-11}$	$3.7.10^{-11}$	$2.4.10^{-11}$	$2.0.10^{-11}$
Pr-142	M	0.005	$5.3.10^{-9}$	$5.0.10^{-4}$	$3.5.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$6.2.10^{-10}$	$5.2.10^{-10}$
	S	0.005	$5.5.10^{-9}$	$5.0.10^{-4}$	$3.7.10^{-9}$	$1.7.10^{-9}$	$1.1.10^{-9}$	$6.6.10^{-10}$	$5.5.10^{-10}$
Pr-142m	M	0.005	$6.7.10^{-11}$	$5.0.10^{-4}$	$4.5.10^{-11}$	$2.0.10^{-11}$	$1.3.10^{-11}$	$7.9.10^{-12}$	$6.6.10^{-12}$
	S	0.005	$7.0.10^{-11}$	$5.0.10^{-4}$	$4.7.10^{-11}$	$2.2.10^{-11}$	$1.4.10^{-11}$	$8.4.10^{-12}$	$7.0.10^{-12}$
Pr-143	M	0.005	$1.2.10^{-8}$	$5.0.10^{-4}$	$8.4.10^{-9}$	$4.6.10^{-9}$	$3.2.10^{-9}$	$2.7.10^{-9}$	$2.2.10^{-9}$
	S	0.005	$1.3.10^{-8}$	$5.0.10^{-4}$	$9.2.10^{-9}$	$5.1.10^{-9}$	$3.6.10^{-9}$	$3.0.10^{-9}$	$2.4.10^{-9}$
Pr-144	M	0.005	$1.9.10^{-10}$	$5.0.10^{-4}$	$1.2.10^{-10}$	$5.0.10^{-11}$	$3.2.10^{-11}$	$2.1.10^{-11}$	$1.8.10^{-11}$
	S	0.005	$1.9.10^{-10}$	$5.0.10^{-4}$	$1.2.10^{-10}$	$5.2.10^{-11}$	$3.4.10^{-11}$	$2.1.10^{-11}$	$1.8.10^{-11}$
Pr-145	M	0.005	$1.6.10^{-9}$	$5.0.10^{-4}$	$1.0.10^{-9}$	$4.7.10^{-10}$	$3.0.10^{-10}$	$1.9.10^{-10}$	$1.6.10^{-10}$
	S	0.005	$1.6.10^{-9}$	$5.0.10^{-4}$	$1.1.10^{-9}$	$4.9.10^{-10}$	$3.2.10^{-10}$	$2.0.10^{-10}$	$1.7.10^{-10}$
Pr-147	M	0.005	$1.5.10^{-10}$	$5.0.10^{-4}$	$1.0.10^{-10}$	$4.8.10^{-11}$	$3.1.10^{-11}$	$2.1.10^{-11}$	$1.8.10^{-11}$
	S	0.005	$1.6.10^{-10}$	$5.0.10^{-4}$	$1.1.10^{-10}$	$5.0.10^{-11}$	$3.3.10^{-11}$	$2.2.10^{-11}$	$1.8.10^{-11}$
neodymium									
Nd-136	M	0.005	$4.6.10^{-10}$	$5.0.10^{-4}$	$3.2.10^{-10}$	$1.6.10^{-10}$	$9.8.10^{-11}$	$6.3.10^{-11}$	$5.1.10^{-11}$
	S	0.005	$4.8.10^{-10}$	$5.0.10^{-4}$	$3.3.10^{-10}$	$1.6.10^{-10}$	$1.0.10^{-10}$	$6.6.10^{-11}$	$5.4.10^{-11}$
Nd-138	M	0.005	$2.3.10^{-9}$	$5.0.10^{-4}$	$1.7.10^{-9}$	$7.7.10^{-10}$	$4.8.10^{-10}$	$2.8.10^{-10}$	$2.3.10^{-10}$
	S	0.005	$2.4.10^{-9}$	$5.0.10^{-4}$	$1.8.10^{-9}$	$8.0.10^{-10}$	$5.0.10^{-10}$	$3.0.10^{-10}$	$2.5.10^{-10}$
Nd-139	M	0.005	$9.0.10^{-11}$	$5.0.10^{-4}$	$6.2.10^{-11}$	$3.0.10^{-11}$	$1.9.10^{-11}$	$1.2.10^{-11}$	$9.9.10^{-12}$
	S	0.005	$9.4.10^{-11}$	$5.0.10^{-4}$	$6.4.10^{-11}$	$3.1.10^{-11}$	$2.0.10^{-11}$	$1.3.10^{-11}$	$1.0.10^{-11}$
Nd-139m	M	0.005	$1.1.10^{-9}$	$5.0.10^{-4}$	$8.8.10^{-10}$	$4.5.10^{-10}$	$2.9.10^{-10}$	$1.8.10^{-10}$	$1.5.10^{-10}$
	S	0.005	$1.2.10^{-9}$	$5.0.10^{-4}$	$9.1.10^{-10}$	$4.6.10^{-10}$	$3.0.10^{-10}$	$1.9.10^{-10}$	$1.5.10^{-10}$
Nd-141	M	0.005	$4.1.10^{-11}$	$5.0.10^{-4}$	$3.1.10^{-11}$	$1.5.10^{-11}$	$9.6.10^{-12}$	$6.0.10^{-12}$	$4.8.10^{-12}$
	S	0.005	$4.3.10^{-11}$	$5.0.10^{-4}$	$3.2.10^{-11}$	$1.6.10^{-11}$	$1.0.10^{-11}$	$6.2.10^{-12}$	$5.0.10^{-12}$
Nd-147	M	0.005	$1.1.10^{-8}$	$5.0.10^{-4}$	$8.0.10^{-9}$	$4.5.10^{-9}$	$3.2.10^{-9}$	$2.6.10^{-9}$	$2.1.10^{-9}$
	S	0.005	$1.2.10^{-8}$	$5.0.10^{-4}$	$8.6.10^{-9}$	$4.9.10^{-9}$	$3.5.10^{-9}$	$3.0.10^{-9}$	$2.4.10^{-9}$
Nd-149	M	0.005	$6.8.10^{-10}$	$5.0.10^{-4}$	$4.6.10^{-10}$	$2.2.10^{-10}$	$1.5.10^{-10}$	$1.0.10^{-10}$	$8.4.10^{-11}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
	S	0.005	$7.1.10^{-10}$	$5.0.10^{-4}$	$4.8.10^{-10}$	$2.3.10^{-10}$	$1.5.10^{-10}$	$1.1.10^{-10}$	$8.9.10^{-11}$
Nd-151	M	0.005	$1.5.10^{-10}$	$5.0.10^{-4}$	$9.9.10^{-11}$	$4.6.10^{-11}$	$3.0.10^{-11}$	$2.0.10^{-11}$	$1.7.10^{-11}$
	S	0.005	$1.5.10^{-10}$	$5.0.10^{-4}$	$1.0.10^{-10}$	$4.8.10^{-11}$	$3.1.10^{-11}$	$2.1.10^{-11}$	$1.7.10^{-11}$
promethium									
Pm-141	M	0.005	$1.4.10^{-10}$	$5.0.10^{-4}$	$9.4.10^{-11}$	$4.3.10^{-11}$	$2.7.10^{-11}$	$1.7.10^{-11}$	$1.4.10^{-11}$
	S	0.005	$1.5.10^{-10}$	$5.0.10^{-4}$	$9.7.10^{-11}$	$4.4.10^{-11}$	$2.8.10^{-11}$	$1.8.10^{-11}$	$1.5.10^{-11}$
Pm-143	M	0.005	$6.2.10^{-9}$	$5.0.10^{-4}$	$5.4.10^{-9}$	$3.3.10^{-9}$	$2.2.10^{-9}$	$1.7.10^{-9}$	$1.5.10^{-9}$
	S	0.005	$5.5.10^{-9}$	$5.0.10^{-4}$	$4.8.10^{-9}$	$3.1.10^{-9}$	$2.1.10^{-9}$	$1.7.10^{-9}$	$1.4.10^{-9}$
Pm-144	M	0.005	$3.1.10^{-8}$	$5.0.10^{-4}$	$2.8.10^{-8}$	$1.8.10^{-8}$	$1.2.10^{-8}$	$9.3.10^{-9}$	$8.2.10^{-9}$
	S	0.005	$2.6.10^{-8}$	$5.0.10^{-4}$	$2.4.10^{-8}$	$1.6.10^{-8}$	$1.1.10^{-8}$	$8.9.10^{-9}$	$7.5.10^{-9}$
Pm-145	M	0.005	$1.1.10^{-8}$	$5.0.10^{-4}$	$9.8.10^{-9}$	$6.4.10^{-9}$	$4.3.10^{-9}$	$3.7.10^{-9}$	$3.6.10^{-9}$
	S	0.005	$7.1.10^{-9}$	$5.0.10^{-4}$	$6.5.10^{-9}$	$4.3.10^{-9}$	$2.9.10^{-9}$	$2.4.10^{-9}$	$2.3.10^{-9}$
Pm-146	M	0.005	$6.4.10^{-8}$	$5.0.10^{-4}$	$5.9.10^{-8}$	$3.9.10^{-8}$	$2.6.10^{-8}$	$2.2.10^{-8}$	$2.1.10^{-8}$
	S	0.005	$5.3.10^{-8}$	$5.0.10^{-4}$	$4.9.10^{-8}$	$3.3.10^{-8}$	$2.2.10^{-8}$	$1.9.10^{-8}$	$1.7.10^{-8}$
Pm-147	M	0.005	$2.1.10^{-8}$	$5.0.10^{-4}$	$1.8.10^{-8}$	$1.1.10^{-8}$	$7.0.10^{-9}$	$5.7.10^{-9}$	$5.0.10^{-9}$
	S	0.005	$1.9.10^{-8}$	$5.0.10^{-4}$	$1.6.10^{-8}$	$1.0.10^{-8}$	$6.8.10^{-9}$	$5.8.10^{-9}$	$4.9.10^{-9}$
Pm-148	M	0.005	$1.5.10^{-8}$	$5.0.10^{-4}$	$1.0.10^{-8}$	$5.2.10^{-9}$	$3.4.10^{-9}$	$2.4.10^{-9}$	$2.0.10^{-9}$
	S	0.005	$1.5.10^{-8}$	$5.0.10^{-4}$	$1.1.10^{-8}$	$5.5.10^{-9}$	$3.7.10^{-9}$	$2.6.10^{-9}$	$2.2.10^{-9}$
Pm-148m	M	0.005	$2.4.10^{-8}$	$5.0.10^{-4}$	$1.9.10^{-8}$	$1.1.10^{-8}$	$7.7.10^{-9}$	$6.3.10^{-9}$	$5.1.10^{-9}$
	S	0.005	$2.5.10^{-8}$	$5.0.10^{-4}$	$2.0.10^{-8}$	$1.2.10^{-8}$	$8.3.10^{-9}$	$7.1.10^{-9}$	$5.7.10^{-9}$
Pm-149	M	0.005	$5.0.10^{-9}$	$5.0.10^{-4}$	$3.5.10^{-9}$	$1.7.10^{-9}$	$1.1.10^{-9}$	$8.3.10^{-10}$	$6.7.10^{-10}$
	S	0.005	$5.3.10^{-9}$	$5.0.10^{-4}$	$3.6.10^{-9}$	$1.8.10^{-9}$	$1.2.10^{-9}$	$9.0.10^{-10}$	$7.3.10^{-10}$
Pm-150	M	0.005	$1.2.10^{-9}$	$5.0.10^{-4}$	$7.9.10^{-10}$	$3.8.10^{-10}$	$2.4.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
	S	0.005	$1.2.10^{-9}$	$5.0.10^{-4}$	$8.2.10^{-10}$	$3.9.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$	$1.3.10^{-10}$
Pm-151	M	0.005	$3.3.10^{-9}$	$5.0.10^{-4}$	$2.5.10^{-9}$	$1.2.10^{-9}$	$8.3.10^{-10}$	$5.3.10^{-10}$	$4.3.10^{-10}$
	S	0.005	$3.4.10^{-9}$	$5.0.10^{-4}$	$2.6.10^{-9}$	$1.3.10^{-9}$	$7.9.10^{-10}$	$5.7.10^{-10}$	$4.6.10^{-10}$
samarium									
Sm-141	M	0.005	$1.5.10^{-10}$	$5.0.10^{-4}$	$1.0.10^{-10}$	$4.7.10^{-11}$	$2.9.10^{-11}$	$1.8.10^{-11}$	$1.5.10^{-11}$
Sm-141m	M	0.005	$3.0.10^{-10}$	$5.0.10^{-4}$	$2.1.10^{-10}$	$9.7.10^{-11}$	$6.1.10^{-11}$	$3.9.10^{-11}$	$3.2.10^{-11}$
Sm-142	M	0.005	$7.5.10^{-10}$	$5.0.10^{-4}$	$4.8.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$8.5.10^{-11}$	$7.1.10^{-11}$
Sm-145	M	0.005	$8.1.10^{-9}$	$5.0.10^{-4}$	$6.8.10^{-9}$	$4.0.10^{-9}$	$2.5.10^{-9}$	$1.9.10^{-9}$	$1.6.10^{-9}$
Sm-146	M	0.005	$2.7.10^{-5}$	$5.0.10^{-4}$	$2.6.10^{-5}$	$1.7.10^{-5}$	$1.2.10^{-5}$	$1.1.10^{-5}$	$1.1.10^{-5}$
Sm-147	M	0.005	$2.5.10^{-5}$	$5.0.10^{-4}$	$2.3.10^{-5}$	$1.6.10^{-5}$	$1.1.10^{-5}$	$9.6.10^{-6}$	$9.6.10^{-6}$
Sm-151	M	0.005	$1.1.10^{-8}$	$5.0.10^{-4}$	$1.0.10^{-8}$	$6.7.10^{-9}$	$4.5.10^{-9}$	$4.0.10^{-9}$	$4.0.10^{-9}$
Sm-153	M	0.005	$4.2.10^{-9}$	$5.0.10^{-4}$	$2.9.10^{-9}$	$1.5.10^{-9}$	$1.0.10^{-9}$	$7.9.10^{-10}$	$6.3.10^{-10}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
Sm-155	M	0.005	$1.5.10^{-10}$	$5.0.10^{-4}$	$9.9.10^{-11}$	$4.4.10^{-11}$	$2.9.10^{-11}$	$2.0.10^{-11}$	$1.7.10^{-11}$
Sm-156	M	0.005	$1.6.10^{-9}$	$5.0.10^{-4}$	$1.1.10^{-9}$	$5.8.10^{-10}$	$3.5.10^{-10}$	$2.7.10^{-10}$	$2.2.10^{-10}$
europium									
Eu-145	M	0.005	$3.6.10^{-9}$	$5.0.10^{-4}$	$2.9.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$6.8.10^{-10}$	$5.5.10^{-10}$
Eu-146	M	0.005	$5.5.10^{-9}$	$5.0.10^{-4}$	$4.4.10^{-9}$	$2.4.10^{-9}$	$1.5.10^{-9}$	$1.0.10^{-9}$	$8.0.10^{-10}$
Eu-147	M	0.005	$4.9.10^{-9}$	$5.0.10^{-4}$	$3.7.10^{-9}$	$2.2.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$
Eu-148	M	0.005	$1.4.10^{-8}$	$5.0.10^{-4}$	$1.2.10^{-8}$	$6.8.10^{-9}$	$4.6.10^{-9}$	$3.2.10^{-9}$	$2.6.10^{-9}$
Eu-149	M	0.005	$1.6.10^{-9}$	$5.0.10^{-4}$	$1.3.10^{-9}$	$7.3.10^{-10}$	$4.7.10^{-10}$	$3.5.10^{-10}$	$2.9.10^{-10}$
Eu-150	M	0.005	$1.1.10^{-7}$	$5.0.10^{-4}$	$1.1.10^{-7}$	$7.8.10^{-8}$	$5.7.10^{-8}$	$5.3.10^{-8}$	$5.3.10^{-8}$
Eu-150m	M	0.005	$1.6.10^{-9}$	$5.0.10^{-4}$	$1.1.10^{-9}$	$5.2.10^{-10}$	$3.4.10^{-10}$	$2.3.10^{-10}$	$1.9.10^{-10}$
Eu-152	M	0.005	$1.1.10^{-7}$	$5.0.10^{-4}$	$1.0.10^{-7}$	$7.0.10^{-8}$	$4.9.10^{-8}$	$4.3.10^{-8}$	$4.2.10^{-8}$
Eu-152m	M	0.005	$1.9.10^{-9}$	$5.0.10^{-4}$	$1.3.10^{-9}$	$6.6.10^{-10}$	$4.2.10^{-10}$	$2.4.10^{-10}$	$2.2.10^{-10}$
Eu-154	M	0.005	$1.6.10^{-7}$	$5.0.10^{-4}$	$1.5.10^{-7}$	$9.7.10^{-8}$	$6.5.10^{-8}$	$5.6.10^{-8}$	$5.3.10^{-8}$
Eu-155	M	0.005	$2.6.10^{-8}$	$5.0.10^{-4}$	$2.3.10^{-8}$	$1.4.10^{-8}$	$9.2.10^{-9}$	$7.6.10^{-9}$	$6.9.10^{-9}$
Eu-156	M	0.005	$1.9.10^{-8}$	$5.0.10^{-4}$	$1.4.10^{-8}$	$7.7.10^{-9}$	$5.3.10^{-9}$	$4.2.10^{-9}$	$3.4.10^{-9}$
Eu-157	M	0.005	$2.5.10^{-9}$	$5.0.10^{-4}$	$1.9.10^{-9}$	$8.9.10^{-10}$	$5.9.10^{-10}$	$3.5.10^{-10}$	$2.8.10^{-10}$
Eu-158	M	0.005	$4.3.10^{-10}$	$5.0.10^{-4}$	$2.9.10^{-10}$	$1.3.10^{-10}$	$8.5.10^{-11}$	$5.6.10^{-11}$	$4.7.10^{-11}$
gadolinium									
Gd-145	F	0.005	$1.3.10^{-10}$	$5.0.10^{-4}$	$9.6.10^{-11}$	$4.7.10^{-11}$	$2.9.10^{-11}$	$1.7.10^{-11}$	$1.4.10^{-11}$
	M	0.005	$1.8.10^{-10}$	$5.0.10^{-4}$	$1.3.10^{-10}$	$6.2.10^{-11}$	$3.9.10^{-11}$	$2.4.10^{-11}$	$2.0.10^{-11}$
Gd-146	F	0.005	$2.9.10^{-8}$	$5.0.10^{-4}$	$2.3.10^{-8}$	$1.2.10^{-8}$	$7.8.10^{-9}$	$5.1.10^{-9}$	$4.4.10^{-9}$
	M	0.005	$2.8.10^{-8}$	$5.0.10^{-4}$	$2.2.10^{-8}$	$1.3.10^{-8}$	$9.3.10^{-9}$	$7.9.10^{-9}$	$6.4.10^{-9}$
Gd-147	F	0.005	$2.1.10^{-9}$	$5.0.10^{-4}$	$1.7.10^{-9}$	$8.4.10^{-10}$	$5.3.10^{-10}$	$3.1.10^{-10}$	$2.6.10^{-10}$
	M	0.005	$2.8.10^{-9}$	$5.0.10^{-4}$	$2.2.10^{-9}$	$1.1.10^{-9}$	$7.5.10^{-10}$	$5.1.10^{-10}$	$4.0.10^{-10}$
Gd-148	F	0.005	$8.3.10^{-5}$	$5.0.10^{-4}$	$7.6.10^{-5}$	$4.7.10^{-5}$	$3.2.10^{-5}$	$2.6.10^{-5}$	$2.6.10^{-5}$
	M	0.005	$3.2.10^{-5}$	$5.0.10^{-4}$	$2.9.10^{-5}$	$1.9.10^{-5}$	$1.3.10^{-5}$	$1.2.10^{-5}$	$1.1.10^{-5}$
Gd-149	F	0.005	$2.6.10^{-9}$	$5.0.10^{-4}$	$2.0.10^{-9}$	$8.0.10^{-10}$	$5.1.10^{-10}$	$3.1.10^{-10}$	$2.6.10^{-10}$
	M	0.005	$3.6.10^{-9}$	$5.0.10^{-4}$	$3.0.10^{-9}$	$1.5.10^{-9}$	$1.1.10^{-9}$	$9.2.10^{-10}$	$7.3.10^{-10}$
Gd-151	F	0.005	$6.3.10^{-9}$	$5.0.10^{-4}$	$4.9.10^{-9}$	$2.5.10^{-9}$	$1.5.10^{-9}$	$9.2.10^{-10}$	$7.8.10^{-10}$
	M	0.005	$4.5.10^{-9}$	$5.0.10^{-4}$	$3.5.10^{-9}$	$2.0.10^{-9}$	$1.3.10^{-9}$	$1.0.10^{-9}$	$8.6.10^{-10}$
Gd-152	F	0.005	$5.9.10^{-5}$	$5.0.10^{-4}$	$5.4.10^{-5}$	$3.4.10^{-5}$	$2.4.10^{-5}$	$1.9.10^{-5}$	$1.9.10^{-5}$
	M	0.005	$2.1.10^{-5}$	$5.0.10^{-4}$	$1.9.10^{-5}$	$1.3.10^{-5}$	$8.9.10^{-6}$	$7.9.10^{-6}$	$8.0.10^{-6}$
Gd-153	F	0.005	$1.5.10^{-8}$	$5.0.10^{-4}$	$1.2.10^{-8}$	$6.5.10^{-9}$	$3.9.10^{-9}$	$2.4.10^{-9}$	$2.1.10^{-9}$
	M	0.005	$9.9.10^{-9}$	$5.0.10^{-4}$	$7.9.10^{-9}$	$4.8.10^{-9}$	$3.1.10^{-9}$	$2.5.10^{-9}$	$2.1.10^{-9}$
Gd-159	F	0.005	$1.2.10^{-9}$	$5.0.10^{-4}$	$8.9.10^{-10}$	$3.8.10^{-10}$	$2.3.10^{-10}$	$1.2.10^{-10}$	$1.0.10^{-10}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
	M	0.005	$2.2.10^{-9}$	$5.0.10^{-4}$	$1.5.10^{-9}$	$7.3.10^{-10}$	$4.9.10^{-10}$	$3.4.10^{-10}$	$2.7.10^{-10}$
terbium									
Tb-147	M	0.005	$6.7.10^{-10}$	$5.0.10^{-4}$	$4.8.10^{-10}$	$2.3.10^{-10}$	$1.5.10^{-10}$	$9.3.10^{-11}$	$7.6.10^{-11}$
Tb-149	M	0.005	$2.1.10^{-8}$	$5.0.10^{-4}$	$1.5.10^{-8}$	$9.6.10^{-9}$	$6.6.10^{-9}$	$5.8.10^{-9}$	$4.9.10^{-9}$
Tb-150	M	0.005	$1.0.10^{-9}$	$5.0.10^{-4}$	$7.4.10^{-10}$	$3.5.10^{-10}$	$2.2.10^{-10}$	$1.3.10^{-10}$	$1.1.10^{-10}$
Tb-151	M	0.005	$1.6.10^{-9}$	$5.0.10^{-4}$	$1.2.10^{-9}$	$6.3.10^{-10}$	$4.2.10^{-10}$	$2.8.10^{-10}$	$2.3.10^{-10}$
Tb-153	M	0.005	$1.4.10^{-9}$	$5.0.10^{-4}$	$1.0.10^{-9}$	$5.4.10^{-10}$	$3.6.10^{-10}$	$2.3.10^{-10}$	$1.9.10^{-10}$
Tb-154	M	0.005	$2.7.10^{-9}$	$5.0.10^{-4}$	$2.1.10^{-9}$	$1.1.10^{-9}$	$7.1.10^{-10}$	$4.5.10^{-10}$	$3.6.10^{-10}$
Tb-155	M	0.005	$1.4.10^{-9}$	$5.0.10^{-4}$	$1.0.10^{-9}$	$5.6.10^{-10}$	$3.4.10^{-10}$	$2.7.10^{-10}$	$2.2.10^{-10}$
Tb-156	M	0.005	$7.0.10^{-9}$	$5.0.10^{-4}$	$5.4.10^{-9}$	$3.0.10^{-9}$	$2.0.10^{-9}$	$1.5.10^{-9}$	$1.2.10^{-9}$
Tb-156m	M	0.005	$1.1.10^{-9}$	$5.0.10^{-4}$	$9.4.10^{-10}$	$4.7.10^{-10}$	$3.3.10^{-10}$	$2.7.10^{-10}$	$2.1.10^{-10}$
Tb-156m’	M	0.005	$6.2.10^{-10}$	$5.0.10^{-4}$	$4.5.10^{-10}$	$2.4.10^{-10}$	$1.7.10^{-10}$	$1.2.10^{-10}$	$9.6.10^{-11}$
Tb-157	M	0.005	$3.2.10^{-9}$	$5.0.10^{-4}$	$3.0.10^{-9}$	$2.0.10^{-9}$	$1.4.10^{-9}$	$1.2.10^{-9}$	$1.2.10^{-9}$
Tb-158	M	0.005	$1.1.10^{-7}$	$5.0.10^{-4}$	$1.0.10^{-7}$	$7.0.10^{-8}$	$5.1.10^{-8}$	$4.7.10^{-8}$	$4.6.10^{-8}$
Tb-160	M	0.005	$3.2.10^{-8}$	$5.0.10^{-4}$	$2.5.10^{-8}$	$1.5.10^{-8}$	$1.0.10^{-8}$	$8.6.10^{-9}$	$7.0.10^{-9}$
Tb-161	M	0.005	$6.6.10^{-9}$	$5.0.10^{-4}$	$4.7.10^{-9}$	$2.6.10^{-9}$	$1.9.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
dysprosium									
Dy-155	M	0.005	$5.6.10^{-10}$	$5.0.10^{-4}$	$4.4.10^{-10}$	$2.3.10^{-10}$	$1.5.10^{-10}$	$9.6.10^{-11}$	$7.7.10^{-11}$
Dy-157	M	0.005	$2.4.10^{-10}$	$5.0.10^{-4}$	$1.9.10^{-10}$	$9.9.10^{-11}$	$6.2.10^{-11}$	$3.8.10^{-11}$	$3.0.10^{-11}$
Dy-159	M	0.005	$2.1.10^{-9}$	$5.0.10^{-4}$	$1.7.10^{-9}$	$9.6.10^{-10}$	$6.0.10^{-10}$	$4.4.10^{-10}$	$3.7.10^{-10}$
Dy-165	M	0.005	$5.2.10^{-10}$	$5.0.10^{-4}$	$3.4.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$7.2.10^{-11}$	$6.0.10^{-11}$
Dy-166	M	0.005	$1.2.10^{-8}$	$5.0.10^{-4}$	$8.3.10^{-9}$	$4.4.10^{-9}$	$3.0.10^{-9}$	$2.3.10^{-9}$	$1.9.10^{-9}$
holmium									
Ho-155	M	0.005	$1.7.10^{-10}$	$5.0.10^{-4}$	$1.2.10^{-10}$	$5.8.10^{-11}$	$3.7.10^{-11}$	$2.4.10^{-11}$	$2.0.10^{-11}$
Ho-157	M	0.005	$3.4.10^{-11}$	$5.0.10^{-4}$	$2.5.10^{-11}$	$1.3.10^{-11}$	$8.0.10^{-12}$	$5.1.10^{-12}$	$4.2.10^{-12}$
Ho-159	M	0.005	$4.6.10^{-11}$	$5.0.10^{-4}$	$3.3.10^{-11}$	$1.7.10^{-11}$	$1.1.10^{-11}$	$7.5.10^{-12}$	$6.1.10^{-12}$
Ho-161	M	0.005	$5.7.10^{-11}$	$5.0.10^{-4}$	$4.0.10^{-11}$	$2.0.10^{-11}$	$1.2.10^{-11}$	$7.5.10^{-12}$	$6.0.10^{-12}$
Ho-162	M	0.005	$2.1.10^{-11}$	$5.0.10^{-4}$	$1.5.10^{-11}$	$7.2.10^{-12}$	$4.8.10^{-12}$	$3.4.10^{-12}$	$2.8.10^{-12}$
Ho-162m	M	0.005	$1.5.10^{-10}$	$5.0.10^{-4}$	$1.1.10^{-10}$	$5.8.10^{-11}$	$3.8.10^{-11}$	$2.6.10^{-11}$	$2.1.10^{-11}$
Ho-164	M	0.005	$6.8.10^{-11}$	$5.0.10^{-4}$	$4.5.10^{-11}$	$2.1.10^{-11}$	$1.4.10^{-11}$	$9.9.10^{-12}$	$8.4.10^{-12}$
Ho-164m	M	0.005	$9.1.10^{-11}$	$5.0.10^{-4}$	$5.9.10^{-11}$	$3.0.10^{-11}$	$2.0.10^{-11}$	$1.3.10^{-11}$	$1.2.10^{-11}$
Ho-166	M	0.005	$6.0.10^{-9}$	$5.0.10^{-4}$	$4.0.10^{-9}$	$1.9.10^{-9}$	$1.2.10^{-9}$	$7.9.10^{-10}$	$6.5.10^{-10}$
Ho-166m	M	0.005	$2.6.10^{-7}$	$5.0.10^{-4}$	$2.5.10^{-7}$	$1.8.10^{-7}$	$1.3.10^{-7}$	$1.2.10^{-7}$	$1.2.10^{-7}$
Ho-167	M	0.005	$5.2.10^{-10}$	$5.0.10^{-4}$	$3.6.10^{-10}$	$1.8.10^{-10}$	$1.2.10^{-10}$	$8.7.10^{-11}$	$7.1.10^{-11}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
erbium									
Er-161	M	0.005	$3.8.10^{-10}$	$5.0.10^{-4}$	$2.9.10^{-10}$	$1.5.10^{-10}$	$9.5.10^{-11}$	$6.0.10^{-11}$	$4.8.10^{-11}$
Er-165	M	0.005	$7.2.10^{-11}$	$5.0.10^{-4}$	$5.3.10^{-11}$	$2.6.10^{-11}$	$1.6.10^{-11}$	$9.6.10^{-12}$	$7.9.10^{-12}$
Er-169	M	0.005	$4.7.10^{-9}$	$5.0.10^{-4}$	$3.5.10^{-9}$	$2.0.10^{-9}$	$1.5.10^{-9}$	$1.3.10^{-9}$	$1.0.10^{-9}$
Er-171	M	0.005	$1.8.10^{-9}$	$5.0.10^{-4}$	$1.2.10^{-9}$	$5.9.10^{-10}$	$3.9.10^{-10}$	$2.7.10^{-10}$	$2.2.10^{-10}$
Er-172	M	0.005	$6.6.10^{-9}$	$5.0.10^{-4}$	$4.7.10^{-9}$	$2.5.10^{-9}$	$1.7.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
thulium									
Tm-162	M	0.005	$1.3.10^{-10}$	$5.0.10^{-4}$	$9.6.10^{-11}$	$4.7.10^{-11}$	$3.0.10^{-11}$	$1.9.10^{-11}$	$1.6.10^{-11}$
Tm-166	M	0.005	$1.3.10^{-9}$	$5.0.10^{-4}$	$9.9.10^{-10}$	$5.2.10^{-10}$	$3.3.10^{-10}$	$2.2.10^{-10}$	$1.7.10^{-10}$
Tm-167	M	0.005	$5.6.10^{-9}$	$5.0.10^{-4}$	$4.1.10^{-9}$	$2.3.10^{-9}$	$1.7.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
Tm-170	M	0.005	$3.6.10^{-8}$	$5.0.10^{-4}$	$2.8.10^{-8}$	$1.6.10^{-8}$	$1.1.10^{-8}$	$8.5.10^{-9}$	$7.0.10^{-9}$
Tm-171	M	0.005	$6.8.10^{-9}$	$5.0.10^{-4}$	$5.7.10^{-9}$	$3.4.10^{-9}$	$2.0.10^{-9}$	$1.6.10^{-9}$	$1.4.10^{-9}$
Tm-172	M	0.005	$8.4.10^{-9}$	$5.0.10^{-4}$	$5.8.10^{-9}$	$2.9.10^{-9}$	$1.9.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
Tm-173	M	0.005	$1.5.10^{-9}$	$5.0.10^{-4}$	$1.0.10^{-9}$	$5.0.10^{-10}$	$3.3.10^{-10}$	$2.2.10^{-10}$	$1.8.10^{-10}$
Tm-175	M	0.005	$1.6.10^{-10}$	$5.0.10^{-4}$	$1.1.10^{-10}$	$5.0.10^{-11}$	$3.3.10^{-11}$	$2.2.10^{-11}$	$1.8.10^{-11}$
ytterbium									
Yb-162	M	0.005	$1.1.10^{-10}$	$5.0.10^{-4}$	$7.9.10^{-11}$	$3.9.10^{-11}$	$2.5.10^{-11}$	$1.6.10^{-11}$	$1.3.10^{-11}$
	S	0.005	$1.2.10^{-10}$	$5.0.10^{-4}$	$8.2.10^{-11}$	$4.0.10^{-11}$	$2.6.10^{-11}$	$1.7.10^{-11}$	$1.4.10^{-11}$
Yb-166	M	0.005	$4.7.10^{-9}$	$5.0.10^{-4}$	$3.5.10^{-9}$	$1.9.10^{-9}$	$1.3.10^{-9}$	$9.0.10^{-10}$	$7.2.10^{-10}$
	S	0.005	$4.9.10^{-9}$	$5.0.10^{-4}$	$3.7.10^{-9}$	$2.0.10^{-9}$	$1.3.10^{-9}$	$9.6.10^{-10}$	$7.7.10^{-10}$
Yb-167	M	0.005	$4.4.10^{-11}$	$5.0.10^{-4}$	$3.1.10^{-11}$	$1.6.10^{-11}$	$1.1.10^{-11}$	$7.9.10^{-12}$	$6.5.10^{-12}$
	S	0.005	$4.6.10^{-11}$	$5.0.10^{-4}$	$3.2.10^{-11}$	$1.7.10^{-11}$	$1.1.10^{-11}$	$8.4.10^{-12}$	$6.9.10^{-12}$
Yb-169	M	0.005	$1.2.10^{-8}$	$5.0.10^{-4}$	$8.7.10^{-9}$	$5.1.10^{-9}$	$3.7.10^{-9}$	$3.2.10^{-9}$	$2.5.10^{-9}$
	S	0.005	$1.3.10^{-8}$	$5.0.10^{-4}$	$9.8.10^{-9}$	$5.9.10^{-9}$	$4.2.10^{-9}$	$3.7.10^{-9}$	$3.0.10^{-9}$
Yb-175	M	0.005	$3.5.10^{-9}$	$5.0.10^{-4}$	$2.5.10^{-9}$	$1.4.10^{-9}$	$9.8.10^{-10}$	$8.3.10^{-10}$	$6.5.10^{-10}$
	S	0.005	$3.7.10^{-9}$	$5.0.10^{-4}$	$2.7.10^{-9}$	$1.5.10^{-9}$	$1.1.10^{-9}$	$9.2.10^{-10}$	$7.3.10^{-10}$
Yb-177	M	0.005	$5.0.10^{-10}$	$5.0.10^{-4}$	$3.3.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$7.8.10^{-11}$	$6.4.10^{-11}$
	S	0.005	$5.3.10^{-10}$	$5.0.10^{-4}$	$3.5.10^{-10}$	$1.7.10^{-10}$	$1.2.10^{-10}$	$8.4.10^{-11}$	$6.9.10^{-11}$
Yb-178	M	0.005	$5.9.10^{-10}$	$5.0.10^{-4}$	$3.9.10^{-10}$	$1.8.10^{-10}$	$1.2.10^{-10}$	$8.5.10^{-11}$	$7.0.10^{-11}$
	S	0.005	$6.2.10^{-10}$	$5.0.10^{-4}$	$4.1.10^{-10}$	$1.9.10^{-10}$	$1.3.10^{-10}$	$9.1.10^{-11}$	$7.5.10^{-11}$
lutetium									
Lu-169	M	0.005	$2.3.10^{-9}$	$5.0.10^{-4}$	$1.8.10^{-9}$	$9.5.10^{-10}$	$6.3.10^{-10}$	$4.4.10^{-10}$	$3.5.10^{-10}$
	S	0.005	$2.4.10^{-9}$	$5.0.10^{-4}$	$1.9.10^{-9}$	$1.0.10^{-9}$	$6.7.10^{-10}$	$4.8.10^{-10}$	$3.8.10^{-10}$
Lu-170	M	0.005	$4.3.10^{-9}$	$5.0.10^{-4}$	$3.4.10^{-9}$	$1.8.10^{-9}$	$1.2.10^{-9}$	$7.8.10^{-10}$	$6.3.10^{-10}$
	S	0.005	$4.5.10^{-9}$	$5.0.10^{-4}$	$3.5.10^{-9}$	$1.8.10^{-9}$	$1.2.10^{-9}$	$8.2.10^{-10}$	$6.6.10^{-10}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Lu-171	M	0.005	$5.0.10^{-9}$	$5.0.10^{-4}$	$3.7.10^{-9}$	$2.1.10^{-9}$	$1.2.10^{-9}$	$9.8.10^{-10}$	$8.0.10^{-10}$
	S	0.005	$4.7.10^{-9}$	$5.0.10^{-4}$	$3.9.10^{-9}$	$2.0.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$	$8.8.10^{-10}$
Lu-172	M	0.005	$8.7.10^{-9}$	$5.0.10^{-4}$	$6.7.10^{-9}$	$3.8.10^{-9}$	$2.6.10^{-9}$	$1.8.10^{-9}$	$1.4.10^{-9}$
	S	0.005	$9.3.10^{-9}$	$5.0.10^{-4}$	$7.1.10^{-9}$	$4.0.10^{-9}$	$2.8.10^{-9}$	$2.0.10^{-9}$	$1.6.10^{-9}$
Lu-173	M	0.005	$1.0.10^{-8}$	$5.0.10^{-4}$	$8.5.10^{-9}$	$5.1.10^{-9}$	$3.2.10^{-9}$	$2.5.10^{-9}$	$2.2.10^{-9}$
	S	0.005	$1.0.10^{-8}$	$5.0.10^{-4}$	$8.7.10^{-9}$	$5.4.10^{-9}$	$3.6.10^{-9}$	$2.9.10^{-9}$	$2.4.10^{-9}$
Lu-174	M	0.005	$1.7.10^{-8}$	$5.0.10^{-4}$	$1.5.10^{-8}$	$9.1.10^{-9}$	$5.8.10^{-9}$	$4.7.10^{-9}$	$4.2.10^{-9}$
	S	0.005	$1.6.10^{-8}$	$5.0.10^{-4}$	$1.4.10^{-8}$	$8.9.10^{-9}$	$5.9.10^{-9}$	$4.9.10^{-9}$	$4.2.10^{-9}$
Lu-174m	M	0.005	$1.9.10^{-8}$	$5.0.10^{-4}$	$1.4.10^{-8}$	$8.6.10^{-9}$	$5.4.10^{-9}$	$4.3.10^{-9}$	$3.7.10^{-9}$
	S	0.005	$2.0.10^{-8}$	$5.0.10^{-4}$	$1.5.10^{-8}$	$9.2.10^{-9}$	$6.1.10^{-9}$	$5.0.10^{-9}$	$4.2.10^{-9}$
Lu-176	M	0.005	$1.8.10^{-7}$	$5.0.10^{-4}$	$1.7.10^{-7}$	$1.1.10^{-7}$	$7.8.10^{-8}$	$7.1.10^{-8}$	$7.0.10^{-8}$
	S	0.005	$1.5.10^{-7}$	$5.0.10^{-4}$	$1.4.10^{-7}$	$9.4.10^{-8}$	$6.5.10^{-8}$	$5.9.10^{-8}$	$5.6.10^{-8}$
Lu-176m	M	0.005	$8.9.10^{-10}$	$5.0.10^{-4}$	$5.9.10^{-10}$	$2.8.10^{-10}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$1.1.10^{-10}$
	S	0.005	$9.3.10^{-10}$	$5.0.10^{-4}$	$6.2.10^{-10}$	$3.0.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$1.2.10^{-10}$
Lu-177	M	0.005	$5.3.10^{-9}$	$5.0.10^{-4}$	$3.8.10^{-9}$	$2.2.10^{-9}$	$1.6.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
	S	0.005	$5.7.10^{-9}$	$5.0.10^{-4}$	$4.1.10^{-9}$	$2.4.10^{-9}$	$1.7.10^{-9}$	$1.5.10^{-9}$	$1.2.10^{-9}$
Lu-177m	M	0.005	$5.8.10^{-8}$	$5.0.10^{-4}$	$4.6.10^{-8}$	$2.8.10^{-8}$	$1.9.10^{-8}$	$1.6.10^{-8}$	$1.3.10^{-8}$
	S	0.005	$6.5.10^{-8}$	$5.0.10^{-4}$	$5.3.10^{-8}$	$3.2.10^{-8}$	$2.3.10^{-8}$	$2.0.10^{-8}$	$1.6.10^{-8}$
Lu-178	M	0.005	$2.3.10^{-10}$	$5.0.10^{-4}$	$1.5.10^{-10}$	$6.6.10^{-11}$	$4.3.10^{-11}$	$2.9.10^{-11}$	$2.4.10^{-11}$
	S	0.005	$2.4.10^{-10}$	$5.0.10^{-4}$	$1.5.10^{-10}$	$6.9.10^{-11}$	$4.5.10^{-11}$	$3.0.10^{-11}$	$2.6.10^{-11}$
Lu-178m	M	0.005	$2.6.10^{-10}$	$5.0.10^{-4}$	$1.8.10^{-10}$	$8.3.10^{-11}$	$5.6.10^{-11}$	$3.8.10^{-11}$	$3.2.10^{-11}$
	S	0.005	$2.7.10^{-10}$	$5.0.10^{-4}$	$1.9.10^{-10}$	$8.7.10^{-11}$	$5.8.10^{-11}$	$4.0.10^{-11}$	$3.3.10^{-11}$
Lu-179	M	0.005	$9.9.10^{-10}$	$5.0.10^{-4}$	$6.5.10^{-10}$	$3.0.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$1.1.10^{-10}$
	S	0.005	$1.0.10^{-9}$	$5.0.10^{-4}$	$6.8.10^{-10}$	$3.2.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$1.2.10^{-10}$
hafnium									
Hf-170	F	0.02	$1.4.10^{-9}$	0.002	$1.1.10^{-9}$	$5.4.10^{-10}$	$3.4.10^{-10}$	$2.0.10^{-10}$	$1.6.10^{-10}$
	M	0.02	$2.2.10^{-9}$	0.002	$1.7.10^{-9}$	$8.7.10^{-10}$	$5.8.10^{-10}$	$3.9.10^{-10}$	$3.2.10^{-10}$
Hf-172	F	0.02	$1.5.10^{-7}$	0.002	$1.3.10^{-7}$	$7.8.10^{-8}$	$4.9.10^{-8}$	$3.5.10^{-8}$	$3.2.10^{-8}$
	M	0.02	$8.1.10^{-8}$	0.002	$6.9.10^{-8}$	$4.3.10^{-8}$	$2.8.10^{-8}$	$2.3.10^{-8}$	$2.0.10^{-8}$
Hf-173	F	0.02	$6.6.10^{-10}$	0.002	$5.0.10^{-10}$	$2.5.10^{-10}$	$1.5.10^{-10}$	$8.9.10^{-11}$	$7.4.10^{-11}$
	M	0.02	$1.1.10^{-9}$	0.002	$8.2.10^{-10}$	$4.3.10^{-10}$	$2.9.10^{-10}$	$2.0.10^{-10}$	$1.6.10^{-10}$
Hf-175	F	0.02	$5.4.10^{-9}$	0.002	$4.0.10^{-9}$	$2.1.10^{-9}$	$1.3.10^{-9}$	$8.5.10^{-10}$	$7.2.10^{-10}$
	M	0.02	$5.8.10^{-9}$	0.002	$4.5.10^{-9}$	$2.6.10^{-9}$	$1.8.10^{-9}$	$1.4.10^{-9}$	$1.2.10^{-9}$
Hf-177m	F	0.02	$3.9.10^{-10}$	0.002	$2.8.10^{-10}$	$1.3.10^{-10}$	$8.5.10^{-11}$	$5.2.10^{-11}$	$4.4.10^{-11}$
	M	0.02	$6.5.10^{-10}$	0.002	$4.7.10^{-10}$	$2.3.10^{-10}$	$1.5.10^{-10}$	$1.1.10^{-10}$	$9.0.10^{-11}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Hf-178m	F	0.02	$6.2.10^{-7}$	0.002	$5.8.10^{-7}$	$4.0.10^{-7}$	$3.1.10^{-7}$	$2.7.10^{-7}$	$2.6.10^{-7}$
	M	0.02	$2.6.10^{-7}$	0.002	$2.4.10^{-7}$	$1.7.10^{-7}$	$1.3.10^{-7}$	$1.2.10^{-7}$	$1.2.10^{-7}$
Hf-179m	F	0.02	$9.7.10^{-9}$	0.002	$6.8.10^{-9}$	$3.4.10^{-9}$	$2.1.10^{-9}$	$1.2.10^{-9}$	$1.1.10^{-9}$
	M	0.02	$1.7.10^{-8}$	0.002	$1.3.10^{-8}$	$7.6.10^{-9}$	$5.5.10^{-9}$	$4.8.10^{-9}$	$3.8.10^{-9}$
Hf-180m	F	0.02	$5.4.10^{-10}$	0.002	$4.1.10^{-10}$	$2.0.10^{-10}$	$1.3.10^{-10}$	$7.2.10^{-11}$	$5.9.10^{-11}$
	M	0.02	$9.1.10^{-10}$	0.002	$6.8.10^{-10}$	$3.6.10^{-10}$	$2.4.10^{-10}$	$1.7.10^{-10}$	$1.3.10^{-10}$
Hf-181	F	0.02	$1.3.10^{-8}$	0.002	$9.6.10^{-9}$	$4.8.10^{-9}$	$2.8.10^{-9}$	$1.7.10^{-9}$	$1.4.10^{-9}$
	M	0.02	$2.2.10^{-8}$	0.002	$1.7.10^{-8}$	$9.9.10^{-9}$	$7.1.10^{-9}$	$6.3.10^{-9}$	$5.0.10^{-9}$
Hf-182	F	0.02	$6.5.10^{-7}$	0.002	$6.2.10^{-7}$	$4.4.10^{-7}$	$3.6.10^{-7}$	$3.1.10^{-7}$	$3.1.10^{-7}$
	M	0.02	$2.4.10^{-7}$	0.002	$2.3.10^{-7}$	$1.7.10^{-7}$	$1.3.10^{-7}$	$1.3.10^{-7}$	$1.3.10^{-7}$
Hf-182m	F	0.02	$1.9.10^{-10}$	0.002	$1.4.10^{-10}$	$6.6.10^{-11}$	$4.2.10^{-11}$	$2.6.10^{-11}$	$2.1.10^{-11}$
	M	0.02	$3.2.10^{-10}$	0.002	$2.3.10^{-10}$	$1.2.10^{-10}$	$7.8.10^{-11}$	$5.6.10^{-11}$	$4.6.10^{-11}$
Hf-183	F	0.02	$2.5.10^{-10}$	0.002	$1.7.10^{-10}$	$7.9.10^{-11}$	$4.9.10^{-11}$	$2.8.10^{-11}$	$2.4.10^{-11}$
	M	0.02	$4.4.10^{-10}$	0.002	$3.0.10^{-10}$	$1.5.10^{-10}$	$9.8.10^{-11}$	$7.0.10^{-11}$	$5.7.10^{-11}$
Hf-184	F	0.02	$1.4.10^{-9}$	0.002	$9.6.10^{-10}$	$4.3.10^{-10}$	$2.7.10^{-10}$	$1.4.10^{-10}$	$1.2.10^{-10}$
	M	0.02	$2.6.10^{-9}$	0.002	$1.8.10^{-9}$	$8.9.10^{-10}$	$5.9.10^{-10}$	$4.0.10^{-10}$	$3.3.10^{-10}$
tantalum									
Ta-172	M	0.01	$2.8.10^{-10}$	0.001	$1.9.10^{-10}$	$9.3.10^{-11}$	$6.0.10^{-11}$	$4.0.10^{-11}$	$3.3.10^{-11}$
	S	0.01	$2.9.10^{-10}$	0.001	$2.0.10^{-10}$	$9.8.10^{-11}$	$6.3.10^{-11}$	$4.2.10^{-11}$	$3.5.10^{-11}$
Ta-173	M	0.01	$8.8.10^{-10}$	0.001	$6.2.10^{-10}$	$3.0.10^{-10}$	$2.0.10^{-10}$	$1.3.10^{-10}$	$1.1.10^{-10}$
	S	0.01	$9.2.10^{-10}$	0.001	$6.5.10^{-10}$	$3.2.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
Ta-174	M	0.01	$3.2.10^{-10}$	0.001	$2.2.10^{-10}$	$1.1.10^{-10}$	$7.1.10^{-11}$	$5.0.10^{-11}$	$4.1.10^{-11}$
	S	0.01	$3.4.10^{-10}$	0.001	$2.3.10^{-10}$	$1.1.10^{-10}$	$7.5.10^{-11}$	$5.3.10^{-11}$	$4.3.10^{-11}$
Ta-175	M	0.01	$9.1.10^{-10}$	0.001	$7.0.10^{-10}$	$3.7.10^{-10}$	$2.4.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
	S	0.01	$9.5.10^{-10}$	0.001	$7.3.10^{-10}$	$3.8.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$	$1.3.10^{-10}$
Ta-176	M	0.01	$1.4.10^{-9}$	0.001	$1.1.10^{-9}$	$5.7.10^{-10}$	$3.7.10^{-10}$	$2.4.10^{-10}$	$1.9.10^{-10}$
	S	0.01	$1.4.10^{-9}$	0.001	$1.1.10^{-9}$	$5.9.10^{-10}$	$3.8.10^{-10}$	$2.5.10^{-10}$	$2.0.10^{-10}$
Ta-177	M	0.01	$6.5.10^{-10}$	0.001	$4.7.10^{-10}$	$2.5.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$	$9.6.10^{-11}$
	S	0.01	$6.9.10^{-10}$	0.001	$5.0.10^{-10}$	$2.7.10^{-10}$	$1.7.10^{-10}$	$1.3.10^{-10}$	$1.1.10^{-10}$
Ta-178m	M	0.01	$4.4.10^{-10}$	0.001	$3.3.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$8.0.10^{-11}$	$6.5.10^{-11}$
	S	0.01	$4.6.10^{-10}$	0.001	$3.4.10^{-10}$	$1.8.10^{-10}$	$1.2.10^{-10}$	$8.5.10^{-11}$	$6.8.10^{-11}$
Ta-179	M	0.01	$1.2.10^{-9}$	0.001	$9.6.10^{-10}$	$5.5.10^{-10}$	$3.5.10^{-10}$	$2.6.10^{-10}$	$2.2.10^{-10}$
	S	0.01	$2.4.10^{-9}$	0.001	$2.1.10^{-9}$	$1.3.10^{-9}$	$8.3.10^{-10}$	$6.4.10^{-10}$	$5.6.10^{-10}$
Ta-180	M	0.01	$3.1.10^{-10}$	0.001	$2.2.10^{-10}$	$1.1.10^{-10}$	$7.4.10^{-11}$	$4.8.10^{-11}$	$4.4.10^{-11}$
	S	0.01	$3.3.10^{-10}$	0.001	$2.3.10^{-10}$	$1.2.10^{-10}$	$7.9.10^{-11}$	$5.2.10^{-11}$	$4.2.10^{-11}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Ta-182	M	0.01	$3.2.10^{-8}$	0.001	$2.6.10^{-8}$	$1.5.10^{-8}$	$1.1.10^{-8}$	$9.5.10^{-9}$	$7.6.10^{-9}$
	S	0.01	$4.2.10^{-8}$	0.001	$3.4.10^{-8}$	$2.1.10^{-8}$	$1.5.10^{-8}$	$1.3.10^{-8}$	$1.0.10^{-8}$
Ta-182m	M	0.01	$1.6.10^{-10}$	0.001	$1.1.10^{-10}$	$4.9.10^{-11}$	$3.4.10^{-11}$	$2.4.10^{-11}$	$2.0.10^{-11}$
	S	0.01	$1.6.10^{-10}$	0.001	$1.1.10^{-10}$	$5.2.10^{-11}$	$3.6.10^{-11}$	$2.5.10^{-11}$	$2.1.10^{-11}$
Ta-183	M	0.01	$1.0.10^{-8}$	0.001	$7.4.10^{-9}$	$4.1.10^{-9}$	$2.9.10^{-9}$	$2.4.10^{-9}$	$1.9.10^{-9}$
	S	0.01	$1.1.10^{-8}$	0.001	$8.0.10^{-9}$	$4.5.10^{-9}$	$3.2.10^{-9}$	$2.7.10^{-9}$	$2.1.10^{-9}$
Ta-184	M	0.01	$3.2.10^{-9}$	0.001	$2.3.10^{-9}$	$1.1.10^{-9}$	$7.5.10^{-10}$	$5.0.10^{-10}$	$4.1.10^{-10}$
	S	0.01	$3.4.10^{-9}$	0.001	$2.4.10^{-9}$	$1.2.10^{-9}$	$7.9.10^{-10}$	$5.4.10^{-10}$	$4.3.10^{-10}$
Ta-185	M	0.01	$3.8.10^{-10}$	0.001	$2.5.10^{-10}$	$1.2.10^{-10}$	$7.7.10^{-11}$	$5.4.10^{-11}$	$4.5.10^{-11}$
	S	0.01	$4.0.10^{-10}$	0.001	$2.6.10^{-10}$	$1.2.10^{-10}$	$8.2.10^{-11}$	$5.7.10^{-11}$	$4.8.10^{-11}$
Ta-186	M	0.01	$1.6.10^{-10}$	0.001	$1.1.10^{-10}$	$4.8.10^{-11}$	$3.1.10^{-11}$	$2.0.10^{-11}$	$1.7.10^{-11}$
	S	0.01	$1.6.10^{-10}$	0.001	$1.1.10^{-10}$	$5.0.10^{-11}$	$3.2.10^{-11}$	$2.1.10^{-11}$	$1.8.10^{-11}$
wolfram									
W-176	F	0.6	$3.3.10^{-10}$	0.3	$2.7.10^{-10}$	$1.4.10^{-10}$	$8.6.10^{-11}$	$5.0.10^{-11}$	$4.1.10^{-11}$
W-177	F	0.6	$2.0.10^{-10}$	0.3	$1.6.10^{-10}$	$8.2.10^{-11}$	$5.1.10^{-11}$	$3.0.10^{-11}$	$2.4.10^{-11}$
W-178	F	0.6	$7.2.10^{-10}$	0.3	$5.4.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$	$8.7.10^{-11}$	$7.2.10^{-11}$
W-179	F	0.6	$9.3.10^{-12}$	0.3	$6.8.10^{-12}$	$3.3.10^{-12}$	$2.0.10^{-12}$	$1.2.10^{-12}$	$9.2.10^{-13}$
W-181	F	0.6	$2.5.10^{-10}$	0.3	$1.9.10^{-10}$	$9.2.10^{-11}$	$5.7.10^{-11}$	$3.2.10^{-11}$	$2.7.10^{-11}$
W-185	F	0.6	$1.4.10^{-9}$	0.3	$1.0.10^{-9}$	$4.4.10^{-10}$	$2.7.10^{-10}$	$1.4.10^{-10}$	$1.2.10^{-10}$
W-187	F	0.6	$2.0.10^{-9}$	0.3	$1.5.10^{-9}$	$7.0.10^{-10}$	$4.3.10^{-10}$	$2.3.10^{-10}$	$1.9.10^{-10}$
W-188	F	0.6	$7.1.10^{-9}$	0.3	$5.0.10^{-9}$	$2.2.10^{-9}$	$1.3.10^{-9}$	$6.8.10^{-10}$	$5.7.10^{-10}$
rhenium									
Re-177	F	1.0	$9.4.10^{-11}$	0.8	$6.7.10^{-11}$	$3.2.10^{-11}$	$1.9.10^{-11}$	$1.2.10^{-11}$	$9.7.10^{-12}$
	M	1.0	$1.1.10^{-10}$	0.8	$7.9.10^{-11}$	$3.9.10^{-11}$	$2.5.10^{-11}$	$1.7.10^{-11}$	$1.4.10^{-11}$
Re-178	F	1.0	$9.9.10^{-11}$	0.8	$6.8.10^{-11}$	$3.1.10^{-11}$	$1.9.10^{-11}$	$1.2.10^{-11}$	$1.0.10^{-11}$
	M	1.0	$1.3.10^{-10}$	0.8	$8.5.10^{-11}$	$3.9.10^{-11}$	$2.6.10^{-11}$	$1.7.10^{-11}$	$1.4.10^{-11}$
Re-181	F	1.0	$2.0.10^{-9}$	0.8	$1.4.10^{-9}$	$6.7.10^{-10}$	$3.8.10^{-10}$	$2.3.10^{-10}$	$1.8.10^{-10}$
	M	1.0	$2.1.10^{-9}$	0.8	$1.5.10^{-9}$	$7.4.10^{-10}$	$4.6.10^{-10}$	$3.1.10^{-10}$	$2.5.10^{-10}$
Re-182	F	1.0	$6.5.10^{-9}$	0.8	$4.7.10^{-9}$	$2.2.10^{-9}$	$1.3.10^{-9}$	$8.0.10^{-10}$	$6.4.10^{-10}$
	M	1.0	$8.7.10^{-9}$	0.8	$6.3.10^{-9}$	$3.4.10^{-9}$	$2.2.10^{-9}$	$1.5.10^{-9}$	$1.2.10^{-9}$
Re-182m	F	1.0	$1.3.10^{-9}$	0.8	$1.0.10^{-9}$	$4.9.10^{-10}$	$2.8.10^{-10}$	$1.7.10^{-10}$	$1.4.10^{-10}$
	M	1.0	$1.4.10^{-9}$	0.8	$1.1.10^{-9}$	$5.7.10^{-10}$	$3.6.10^{-10}$	$2.5.10^{-10}$	$2.0.10^{-10}$
Re-184	F	1.0	$4.1.10^{-9}$	0.8	$2.9.10^{-9}$	$1.4.10^{-9}$	$8.6.10^{-10}$	$5.4.10^{-10}$	$4.4.10^{-10}$
	M	1.0	$9.1.10^{-9}$	0.8	$6.8.10^{-9}$	$4.0.10^{-9}$	$2.8.10^{-9}$	$2.4.10^{-9}$	$1.9.10^{-9}$
Re-184m	F	1.0	$6.6.10^{-9}$	0.8	$4.6.10^{-9}$	$2.0.10^{-9}$	$1.2.10^{-9}$	$7.3.10^{-10}$	$5.9.10^{-10}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
	M	1.0	$2.9.10^{-8}$	0.8	$2.2.10^{-8}$	$1.3.10^{-8}$	$9.3.10^{-9}$	$8.1.10^{-9}$	$6.5.10^{-9}$
Re-186	F	1.0	$7.3.10^{-9}$	0.8	$4.7.10^{-9}$	$2.0.10^{-9}$	$1.1.10^{-9}$	$6.6.10^{-10}$	$5.2.10^{-10}$
	M	1.0	$8.7.10^{-9}$	0.8	$5.7.10^{-9}$	$2.8.10^{-9}$	$1.8.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
Re-186m	F	1.0	$1.2.10^{-8}$	0.8	$7.0.10^{-9}$	$2.9.10^{-9}$	$1.7.10^{-9}$	$1.0.10^{-9}$	$8.3.10^{-10}$
	M	1.0	$5.9.10^{-8}$	0.8	$4.6.10^{-8}$	$2.7.10^{-8}$	$1.8.10^{-8}$	$1.4.10^{-8}$	$1.2.10^{-8}$
Re-187	F	1.0	$2.6.10^{-11}$	0.8	$1.6.10^{-11}$	$6.8.10^{-12}$	$3.8.10^{-12}$	$2.3.10^{-12}$	$1.8.10^{-12}$
	M	1.0	$5.7.10^{-11}$	0.8	$4.1.10^{-11}$	$2.0.10^{-11}$	$1.2.10^{-11}$	$7.5.10^{-12}$	$6.3.10^{-12}$
Re-188	F	1.0	$6.5.10^{-9}$	0.8	$4.4.10^{-9}$	$1.9.10^{-9}$	$1.0.10^{-9}$	$6.1.10^{-10}$	$4.6.10^{-10}$
	M	1.0	$6.0.10^{-9}$	0.8	$4.0.10^{-9}$	$1.8.10^{-9}$	$1.0.10^{-9}$	$6.8.10^{-10}$	$5.4.10^{-10}$
Re-188m	F	1.0	$1.4.10^{-10}$	0.8	$9.1.10^{-11}$	$4.0.10^{-11}$	$2.1.10^{-11}$	$1.3.10^{-11}$	$1.0.10^{-11}$
	M	1.0	$1.3.10^{-10}$	0.8	$8.6.10^{-11}$	$4.0.10^{-11}$	$2.7.10^{-11}$	$1.6.10^{-11}$	$1.3.10^{-11}$
Re-189	F	1.0	$3.7.10^{-9}$	0.8	$2.5.10^{-9}$	$1.1.10^{-9}$	$5.8.10^{-10}$	$3.5.10^{-10}$	$2.7.10^{-10}$
	M	1.0	$3.9.10^{-9}$	0.8	$2.6.10^{-9}$	$1.2.10^{-9}$	$7.6.10^{-10}$	$5.5.10^{-10}$	$4.3.10^{-10}$
osmium									
Os-180	F	0.02	$7.1.10^{-11}$	0.01	$5.3.10^{-11}$	$2.6.10^{-11}$	$1.6.10^{-11}$	$1.0.10^{-11}$	$8.2.10^{-12}$
	M	0.02	$1.1.10^{-10}$	0.01	$7.9.10^{-11}$	$3.9.10^{-11}$	$2.5.10^{-11}$	$1.7.10^{-11}$	$1.4.10^{-11}$
	S	0.02	$1.1.10^{-10}$	0.01	$8.2.10^{-11}$	$4.1.10^{-11}$	$2.6.10^{-11}$	$1.8.10^{-11}$	$1.5.10^{-11}$
Os-181	F	0.02	$3.0.10^{-10}$	0.01	$2.3.10^{-10}$	$1.1.10^{-10}$	$7.0.10^{-11}$	$4.1.10^{-11}$	$3.3.10^{-11}$
	M	0.02	$4.5.10^{-10}$	0.01	$3.4.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$7.6.10^{-11}$	$6.2.10^{-11}$
	S	0.02	$4.7.10^{-10}$	0.01	$3.6.10^{-10}$	$1.8.10^{-10}$	$1.2.10^{-10}$	$8.1.10^{-11}$	$6.5.10^{-11}$
Os-182	F	0.02	$1.6.10^{-9}$	0.01	$1.2.10^{-9}$	$6.0.10^{-10}$	$3.7.10^{-10}$	$2.1.10^{-10}$	$1.7.10^{-10}$
	M	0.02	$2.5.10^{-9}$	0.01	$1.9.10^{-9}$	$1.0.10^{-9}$	$6.6.10^{-10}$	$4.5.10^{-10}$	$3.6.10^{-10}$
	S	0.02	$2.6.10^{-9}$	0.01	$2.0.10^{-9}$	$1.0.10^{-9}$	$6.9.10^{-10}$	$4.8.10^{-10}$	$3.8.10^{-10}$
Os-185	F	0.02	$7.2.10^{-9}$	0.01	$5.8.10^{-9}$	$3.1.10^{-9}$	$1.9.10^{-9}$	$1.2.10^{-9}$	$1.1.10^{-9}$
	M	0.02	$6.6.10^{-9}$	0.01	$5.4.10^{-9}$	$2.9.10^{-9}$	$2.0.10^{-9}$	$1.5.10^{-9}$	$1.3.10^{-9}$
	S	0.02	$7.0.10^{-9}$	0.01	$5.8.10^{-9}$	$3.6.10^{-9}$	$2.4.10^{-9}$	$1.9.10^{-9}$	$1.6.10^{-9}$
Os-189m	F	0.02	$3.8.10^{-11}$	0.01	$2.8.10^{-11}$	$1.2.10^{-11}$	$7.0.10^{-12}$	$3.5.10^{-12}$	$2.5.10^{-12}$
	M	0.02	$6.5.10^{-11}$	0.01	$4.1.10^{-11}$	$1.8.10^{-11}$	$1.1.10^{-11}$	$6.0.10^{-12}$	$5.0.10^{-12}$
	S	0.02	$6.8.10^{-11}$	0.01	$4.3.10^{-11}$	$1.9.10^{-11}$	$1.2.10^{-11}$	$6.3.10^{-12}$	$5.3.10^{-12}$
Os-191	F	0.02	$2.8.10^{-9}$	0.01	$1.9.10^{-9}$	$8.5.10^{-10}$	$5.3.10^{-10}$	$3.0.10^{-10}$	$2.5.10^{-10}$
	M	0.02	$8.0.10^{-9}$	0.01	$5.8.10^{-9}$	$3.4.10^{-9}$	$2.4.10^{-9}$	$2.0.10^{-9}$	$1.7.10^{-9}$
	S	0.02	$9.0.10^{-9}$	0.01	$6.5.10^{-9}$	$3.9.10^{-9}$	$2.7.10^{-9}$	$2.3.10^{-9}$	$1.9.10^{-9}$
Os-191m	F	0.02	$3.0.10^{-10}$	0.01	$2.0.10^{-10}$	$8.8.10^{-11}$	$5.4.10^{-11}$	$2.9.10^{-11}$	$2.4.10^{-11}$
	M	0.02	$7.8.10^{-10}$	0.01	$5.4.10^{-10}$	$3.1.10^{-10}$	$2.1.10^{-10}$	$1.7.10^{-10}$	$1.4.10^{-10}$
	S	0.02	$8.5.10^{-10}$	0.01	$6.0.10^{-10}$	$3.4.10^{-10}$	$2.4.10^{-10}$	$2.0.10^{-10}$	$1.6.10^{-10}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
Os-193	F	0.02	$1.9.10^{-9}$	0.01	$1.2.10^{-9}$	$5.2.10^{-10}$	$3.2.10^{-10}$	$1.8.10^{-10}$	$1.6.10^{-10}$
	M	0.02	$3.8.10^{-9}$	0.01	$2.6.10^{-9}$	$1.3.10^{-9}$	$8.4.10^{-10}$	$5.9.10^{-10}$	$4.8.10^{-10}$
	S	0.02	$4.0.10^{-9}$	0.01	$2.7.10^{-9}$	$1.3.10^{-9}$	$9.0.10^{-10}$	$6.4.10^{-10}$	$5.2.10^{-10}$
Os-194	F	0.02	$8.7.10^{-8}$	0.01	$6.8.10^{-8}$	$3.4.10^{-8}$	$2.1.10^{-8}$	$1.3.10^{-8}$	$1.1.10^{-8}$
	M	0.02	$9.9.10^{-8}$	0.01	$8.3.10^{-8}$	$4.8.10^{-8}$	$3.1.10^{-8}$	$2.4.10^{-8}$	$2.1.10^{-8}$
	S	0.02	$2.6.10^{-7}$	0.01	$2.4.10^{-7}$	$1.6.10^{-7}$	$1.1.10^{-7}$	$8.8.10^{-8}$	$8.5.10^{-8}$
iridium									
Ir-182	F	0.02	$1.4.10^{-10}$	0.01	$9.8.10^{-11}$	$4.5.10^{-11}$	$2.8.10^{-11}$	$1.7.10^{-11}$	$1.4.10^{-11}$
	M	0.02	$2.1.10^{-10}$	0.01	$1.4.10^{-10}$	$6.7.10^{-11}$	$4.3.10^{-11}$	$2.8.10^{-11}$	$2.3.10^{-11}$
	S	0.02	$2.2.10^{-10}$	0.01	$1.5.10^{-10}$	$6.9.10^{-11}$	$4.4.10^{-11}$	$2.9.10^{-11}$	$2.4.10^{-11}$
Ir-184	F	0.02	$5.7.10^{-10}$	0.01	$4.4.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$7.6.10^{-11}$	$6.2.10^{-11}$
	M	0.02	$8.6.10^{-10}$	0.01	$6.4.10^{-10}$	$3.2.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
	S	0.02	$8.9.10^{-10}$	0.01	$6.6.10^{-10}$	$3.4.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$1.2.10^{-10}$
Ir-185	F	0.02	$8.0.10^{-10}$	0.01	$6.1.10^{-10}$	$2.9.10^{-10}$	$1.8.10^{-10}$	$1.0.10^{-10}$	$8.2.10^{-11}$
	M	0.02	$1.3.10^{-9}$	0.01	$9.7.10^{-10}$	$4.9.10^{-10}$	$3.2.10^{-10}$	$2.2.10^{-10}$	$1.8.10^{-10}$
	S	0.02	$1.4.10^{-9}$	0.01	$1.0.10^{-9}$	$5.2.10^{-10}$	$3.4.10^{-10}$	$2.3.10^{-10}$	$1.9.10^{-10}$
Ir-186	F	0.02	$1.5.10^{-9}$	0.01	$1.2.10^{-9}$	$5.9.10^{-10}$	$3.6.10^{-10}$	$2.1.10^{-10}$	$1.7.10^{-10}$
	M	0.02	$2.2.10^{-9}$	0.01	$1.7.10^{-9}$	$8.8.10^{-10}$	$5.8.10^{-10}$	$3.8.10^{-10}$	$3.1.10^{-10}$
	S	0.02	$2.3.10^{-9}$	0.01	$1.8.10^{-9}$	$9.2.10^{-10}$	$6.0.10^{-10}$	$4.0.10^{-10}$	$3.2.10^{-10}$
Ir-186m	F	0.02	$2.1.10^{-10}$	0.01	$1.6.10^{-10}$	$7.7.10^{-11}$	$4.8.10^{-11}$	$2.8.10^{-11}$	$2.3.10^{-11}$
	M	0.02	$3.3.10^{-10}$	0.01	$2.4.10^{-10}$	$1.2.10^{-10}$	$7.7.10^{-11}$	$5.1.10^{-11}$	$4.2.10^{-11}$
	S	0.02	$3.4.10^{-10}$	0.01	$2.5.10^{-10}$	$1.2.10^{-10}$	$8.1.10^{-11}$	$5.4.10^{-11}$	$4.4.10^{-11}$
Ir-187	F	0.02	$3.6.10^{-10}$	0.01	$2.8.10^{-10}$	$1.4.10^{-10}$	$8.2.10^{-11}$	$4.6.10^{-11}$	$3.7.10^{-11}$
	M	0.02	$5.8.10^{-10}$	0.01	$4.3.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$9.2.10^{-11}$	$7.4.10^{-11}$
	S	0.02	$6.0.10^{-10}$	0.01	$4.5.10^{-10}$	$2.3.10^{-10}$	$1.5.10^{-10}$	$9.7.10^{-11}$	$7.9.10^{-11}$
Ir-188	F	0.02	$2.0.10^{-9}$	0.01	$1.6.10^{-9}$	$8.0.10^{-10}$	$5.0.10^{-10}$	$2.9.10^{-10}$	$2.4.10^{-10}$
	M	0.02	$2.7.10^{-9}$	0.01	$2.1.10^{-9}$	$1.1.10^{-9}$	$7.5.10^{-10}$	$5.0.10^{-10}$	$4.0.10^{-10}$
	S	0.02	$2.8.10^{-9}$	0.01	$2.2.10^{-9}$	$1.2.10^{-9}$	$7.8.10^{-10}$	$5.2.10^{-10}$	$4.2.10^{-10}$
Ir-189	F	0.02	$1.2.10^{-9}$	0.01	$8.2.10^{-10}$	$3.8.10^{-10}$	$2.4.10^{-10}$	$1.3.10^{-10}$	$1.1.10^{-10}$
	M	0.02	$2.7.10^{-9}$	0.01	$1.9.10^{-9}$	$1.1.10^{-9}$	$7.7.10^{-10}$	$6.4.10^{-10}$	$5.2.10^{-10}$
	S	0.02	$3.0.10^{-9}$	0.01	$2.2.10^{-9}$	$1.3.10^{-9}$	$8.7.10^{-10}$	$7.3.10^{-10}$	$6.0.10^{-10}$
Ir-190	F	0.02	$6.2.10^{-9}$	0.01	$4.7.10^{-9}$	$2.4.10^{-9}$	$1.5.10^{-9}$	$9.1.10^{-10}$	$7.7.10^{-10}$
	M	0.02	$1.1.10^{-8}$	0.01	$8.6.10^{-9}$	$4.4.10^{-9}$	$3.1.10^{-9}$	$2.7.10^{-9}$	$2.1.10^{-9}$
	S	0.02	$1.1.10^{-8}$	0.01	$9.4.10^{-9}$	$4.8.10^{-9}$	$3.5.10^{-9}$	$3.0.10^{-9}$	$2.4.10^{-9}$
Ir-190m’	F	0.02	$4.2.10^{-10}$	0.01	$3.4.10^{-10}$	$1.7.10^{-10}$	$1.0.10^{-10}$	$6.0.10^{-11}$	$4.9.10^{-11}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
	M	0.02	$6.0.10^{-10}$	0.01	$4.7.10^{-10}$	$2.4.10^{-10}$	$1.5.10^{-10}$	$9.9.10^{-11}$	$7.9.10^{-11}$
	S	0.02	$6.2.10^{-10}$	0.01	$4.8.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$	$1.0.10^{-10}$	$8.3.10^{-11}$
Ir-190m	F	0.02	$3.2.10^{-11}$	0.01	$2.4.10^{-11}$	$1.2.10^{-11}$	$7.2.10^{-12}$	$4.3.10^{-12}$	$3.6.10^{-12}$
	M	0.02	$5.7.10^{-11}$	0.01	$4.2.10^{-11}$	$2.0.10^{-11}$	$1.4.10^{-11}$	$1.2.10^{-11}$	$9.3.10^{-12}$
	S	0.02	$5.5.10^{-11}$	0.01	$4.5.10^{-11}$	$2.2.10^{-11}$	$1.6.10^{-11}$	$1.3.10^{-11}$	$1.0.10^{-11}$
Ir-192	F	0.02	$1.5.10^{-8}$	0.01	$1.1.10^{-8}$	$5.7.10^{-9}$	$3.3.10^{-9}$	$2.1.10^{-9}$	$1.8.10^{-9}$
	M	0.02	$2.3.10^{-8}$	0.01	$1.8.10^{-8}$	$1.1.10^{-8}$	$7.6.10^{-9}$	$6.4.10^{-9}$	$5.2.10^{-9}$
	S	0.02	$2.8.10^{-8}$	0.01	$2.2.10^{-8}$	$1.3.10^{-8}$	$9.5.10^{-9}$	$8.1.10^{-9}$	$6.6.10^{-9}$
Ir-192m	F	0.02	$2.7.10^{-8}$	0.01	$2.3.10^{-8}$	$1.4.10^{-8}$	$8.2.10^{-9}$	$5.4.10^{-9}$	$4.8.10^{-9}$
	M	0.02	$2.3.10^{-8}$	0.01	$2.1.10^{-8}$	$1.3.10^{-8}$	$8.4.10^{-9}$	$6.6.10^{-9}$	$5.8.10^{-9}$
	S	0.02	$9.2.10^{-8}$	0.01	$9.1.10^{-8}$	$6.5.10^{-8}$	$4.5.10^{-8}$	$4.0.10^{-8}$	$3.9.10^{-8}$
Ir-193m	F	0.02	$1.2.10^{-9}$	0.01	$8.4.10^{-10}$	$3.7.10^{-10}$	$2.2.10^{-10}$	$1.2.10^{-10}$	$1.0.10^{-10}$
	M	0.02	$4.8.10^{-9}$	0.01	$3.5.10^{-9}$	$2.1.10^{-9}$	$1.5.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
	S	0.02	$5.4.10^{-9}$	0.01	$4.0.10^{-9}$	$2.4.10^{-9}$	$1.8.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$
Ir-194	F	0.02	$2.9.10^{-9}$	0.01	$1.9.10^{-9}$	$8.1.10^{-10}$	$4.9.10^{-10}$	$2.5.10^{-10}$	$2.1.10^{-10}$
	M	0.02	$5.3.10^{-9}$	0.01	$3.5.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$6.3.10^{-10}$	$5.2.10^{-10}$
	S	0.02	$5.5.10^{-9}$	0.01	$3.7.10^{-9}$	$1.7.10^{-9}$	$1.1.10^{-9}$	$6.7.10^{-10}$	$5.6.10^{-10}$
Ir-194m	F	0.02	$3.4.10^{-8}$	0.01	$2.7.10^{-8}$	$1.4.10^{-8}$	$9.5.10^{-9}$	$6.2.10^{-9}$	$5.4.10^{-9}$
	M	0.02	$3.9.10^{-8}$	0.01	$3.2.10^{-8}$	$1.9.10^{-8}$	$1.3.10^{-8}$	$1.1.10^{-8}$	$9.0.10^{-9}$
	S	0.02	$5.0.10^{-8}$	0.01	$4.2.10^{-8}$	$2.6.10^{-8}$	$1.8.10^{-8}$	$1.5.10^{-8}$	$1.3.10^{-8}$
Ir-195	F	0.02	$2.9.10^{-10}$	0.01	$1.9.10^{-10}$	$8.1.10^{-11}$	$5.1.10^{-11}$	$2.9.10^{-11}$	$2.4.10^{-11}$
	M	0.02	$5.4.10^{-10}$	0.01	$3.6.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$8.1.10^{-11}$	$6.7.10^{-11}$
	S	0.02	$5.7.10^{-10}$	0.01	$3.8.10^{-10}$	$1.8.10^{-10}$	$1.2.10^{-10}$	$8.7.10^{-11}$	$7.1.10^{-11}$
Ir-195m	F	0.02	$6.9.10^{-10}$	0.01	$4.8.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$7.2.10^{-11}$	$6.0.10^{-11}$
	M	0.02	$1.2.10^{-9}$	0.01	$8.6.10^{-10}$	$4.2.10^{-10}$	$2.7.10^{-10}$	$1.9.10^{-10}$	$1.6.10^{-10}$
	S	0.02	$1.3.10^{-9}$	0.01	$9.0.10^{-10}$	$4.4.10^{-10}$	$2.9.10^{-10}$	$2.0.10^{-10}$	$1.7.10^{-10}$
platinum									
Pt-186	F	0.02	$3.0.10^{-10}$	0.01	$2.4.10^{-10}$	$1.2.10^{-10}$	$7.2.10^{-11}$	$4.1.10^{-11}$	$3.3.10^{-11}$
Pt-188	F	0.02	$3.6.10^{-9}$	0.01	$2.7.10^{-9}$	$1.3.10^{-9}$	$8.4.10^{-10}$	$5.0.10^{-10}$	$4.2.10^{-10}$
Pt-189	F	0.02	$3.8.10^{-10}$	0.01	$2.9.10^{-10}$	$1.4.10^{-10}$	$8.4.10^{-11}$	$4.7.10^{-11}$	$3.8.10^{-11}$
Pt-191	F	0.02	$1.1.10^{-9}$	0.01	$7.9.10^{-10}$	$3.7.10^{-10}$	$2.3.10^{-10}$	$1.3.10^{-10}$	$1.1.10^{-10}$
Pt-193	F	0.02	$2.2.10^{-10}$	0.01	$1.6.10^{-10}$	$7.2.10^{-11}$	$4.3.10^{-11}$	$2.5.10^{-11}$	$2.1.10^{-11}$
Pt-193m	F	0.02	$1.6.10^{-9}$	0.01	$1.0.10^{-9}$	$4.5.10^{-10}$	$2.7.10^{-10}$	$1.4.10^{-10}$	$1.2.10^{-10}$
Pt-195m	F	0.02	$2.2.10^{-9}$	0.01	$1.5.10^{-9}$	$6.4.10^{-10}$	$3.9.10^{-10}$	$2.1.10^{-10}$	$1.8.10^{-10}$
Pt-197	F	0.02	$1.1.10^{-9}$	0.01	$7.3.10^{-10}$	$3.1.10^{-10}$	$1.9.10^{-10}$	$1.0.10^{-10}$	$8.5.10^{-11}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
Pt-197m	F	0.02	$2.8.10^{-10}$	0.01	$1.8.10^{-10}$	$7.9.10^{-11}$	$4.9.10^{-11}$	$2.8.10^{-11}$	$2.4.10^{-11}$
Pt-199	F	0.02	$1.3.10^{-10}$	0.01	$8.3.10^{-11}$	$3.6.10^{-11}$	$2.3.10^{-11}$	$1.4.10^{-11}$	$1.2.10^{-11}$
Pt-200	F	0.02	$2.6.10^{-9}$	0.01	$1.7.10^{-9}$	$7.2.10^{-10}$	$5.1.10^{-10}$	$2.6.10^{-10}$	$2.2.10^{-10}$
gold									
Au-193	F	0.2	$3.7.10^{-10}$	0.1	$2.8.10^{-10}$	$1.3.10^{-10}$	$7.9.10^{-11}$	$4.3.10^{-11}$	$3.6.10^{-11}$
	M	0.2	$7.5.10^{-10}$	0.1	$5.6.10^{-10}$	$2.8.10^{-10}$	$1.9.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
	S	0.2	$7.9.10^{-10}$	0.1	$5.9.10^{-10}$	$3.0.10^{-10}$	$2.0.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
Au-194	F	0.2	$1.2.10^{-9}$	0.1	$9.6.10^{-10}$	$4.9.10^{-10}$	$3.0.10^{-10}$	$1.8.10^{-10}$	$1.4.10^{-10}$
	M	0.2	$1.7.10^{-9}$	0.1	$1.4.10^{-9}$	$7.1.10^{-10}$	$4.6.10^{-10}$	$2.9.10^{-10}$	$2.3.10^{-10}$
	S	0.2	$1.7.10^{-9}$	0.1	$1.4.10^{-9}$	$7.3.10^{-10}$	$4.7.10^{-10}$	$3.0.10^{-10}$	$2.4.10^{-10}$
Au-195	F	0.2	$7.2.10^{-10}$	0.1	$5.3.10^{-10}$	$2.5.10^{-10}$	$1.5.10^{-10}$	$8.1.10^{-11}$	$6.6.10^{-11}$
	M	0.2	$5.2.10^{-9}$	0.1	$4.1.10^{-9}$	$2.4.10^{-9}$	$1.6.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$
	S	0.2	$8.1.10^{-9}$	0.1	$6.6.10^{-9}$	$3.9.10^{-9}$	$2.6.10^{-9}$	$2.1.10^{-9}$	$1.7.10^{-9}$
Au-198	F	0.2	$2.4.10^{-9}$	0.1	$1.7.10^{-9}$	$7.6.10^{-10}$	$4.7.10^{-10}$	$2.5.10^{-10}$	$2.1.10^{-10}$
	M	0.2	$5.0.10^{-9}$	0.1	$4.1.10^{-9}$	$1.9.10^{-9}$	$1.3.10^{-9}$	$9.7.10^{-10}$	$7.8.10^{-10}$
	S	0.2	$5.4.10^{-9}$	0.1	$4.4.10^{-9}$	$2.0.10^{-9}$	$1.4.10^{-9}$	$1.1.10^{-9}$	$8.6.10^{-10}$
Au-198m	F	0.2	$3.3.10^{-9}$	0.1	$2.4.10^{-9}$	$1.1.10^{-9}$	$6.9.10^{-10}$	$3.7.10^{-10}$	$3.2.10^{-10}$
	M	0.2	$8.7.10^{-9}$	0.1	$6.5.10^{-9}$	$3.6.10^{-9}$	$2.6.10^{-9}$	$2.2.10^{-9}$	$1.8.10^{-9}$
	S	0.2	$9.5.10^{-9}$	0.1	$7.1.10^{-9}$	$4.0.10^{-9}$	$2.9.10^{-9}$	$2.5.10^{-9}$	$2.0.10^{-9}$
Au-199	F	0.2	$1.1.10^{-9}$	0.1	$7.9.10^{-10}$	$3.5.10^{-10}$	$2.2.10^{-10}$	$1.1.10^{-10}$	$9.8.10^{-11}$
	M	0.2	$3.4.10^{-9}$	0.1	$2.5.10^{-9}$	$1.4.10^{-9}$	$1.0.10^{-9}$	$9.0.10^{-10}$	$7.1.10^{-10}$
	S	0.2	$3.8.10^{-9}$	0.1	$2.8.10^{-9}$	$1.6.10^{-9}$	$1.2.10^{-9}$	$1.0.10^{-9}$	$7.9.10^{-10}$
Au-200	F	0.2	$1.9.10^{-10}$	0.1	$1.2.10^{-10}$	$5.2.10^{-11}$	$3.2.10^{-11}$	$1.9.10^{-11}$	$1.6.10^{-11}$
	M	0.2	$3.2.10^{-10}$	0.1	$2.1.10^{-10}$	$9.3.10^{-11}$	$6.0.10^{-11}$	$4.0.10^{-11}$	$3.3.10^{-11}$
	S	0.2	$3.4.10^{-10}$	0.1	$2.1.10^{-10}$	$9.8.10^{-11}$	$6.3.10^{-11}$	$4.2.10^{-11}$	$3.5.10^{-11}$
Au-200m	F	0.2	$2.7.10^{-9}$	0.1	$2.1.10^{-9}$	$1.0.10^{-9}$	$6.4.10^{-10}$	$3.6.10^{-10}$	$2.9.10^{-10}$
	M	0.2	$4.8.10^{-9}$	0.1	$3.7.10^{-9}$	$1.9.10^{-9}$	$1.2.10^{-9}$	$8.4.10^{-10}$	$6.8.10^{-10}$
	S	0.2	$5.1.10^{-9}$	0.1	$3.9.10^{-9}$	$2.0.10^{-9}$	$1.3.10^{-9}$	$8.9.10^{-10}$	$7.2.10^{-10}$
Au-201	F	0.2	$9.0.10^{-11}$	0.1	$5.7.10^{-11}$	$2.5.10^{-11}$	$1.6.10^{-11}$	$1.0.10^{-11}$	$8.7.10^{-12}$
	M	0.2	$1.5.10^{-10}$	0.1	$9.6.10^{-11}$	$4.3.10^{-11}$	$2.9.10^{-11}$	$2.0.10^{-11}$	$1.7.10^{-11}$
	S	0.2	$1.5.10^{-10}$	0.1	$1.0.10^{-10}$	$4.5.10^{-11}$	$3.0.10^{-11}$	$2.1.10^{-11}$	$1.7.10^{-11}$
mercury									
Hg-193 org.	F	0.8	$2.2.10^{-10}$	0.4	$1.8.10^{-10}$	$8.2.10^{-11}$	$5.0.10^{-11}$	$2.9.10^{-11}$	$2.4.10^{-11}$
Hg-193 anorg.	F	0.04	$2.7.10^{-10}$	0.02	$2.0.10^{-10}$	$8.9.10^{-11}$	$5.5.10^{-11}$	$3.1.10^{-11}$	$2.6.10^{-11}$
	M	0.04	$5.3.10^{-10}$	0.02	$3.8.10^{-10}$	$1.9.10^{-10}$	$1.3.10^{-10}$	$9.2.10^{-11}$	$7.5.10^{-11}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
Hg-193m org.	F	0.8	$8.4 \cdot 10^{-10}$	0.4	$7.6 \cdot 10^{-10}$	$3.7 \cdot 10^{-10}$	$2.2 \cdot 10^{-10}$	$1.3 \cdot 10^{-10}$	$1.0 \cdot 10^{-10}$
Hg-193m anorg.	F	0.04	$1.1 \cdot 10^{-9}$	0.02	$8.5 \cdot 10^{-10}$	$4.1 \cdot 10^{-10}$	$2.5 \cdot 10^{-10}$	$1.4 \cdot 10^{-10}$	$1.1 \cdot 10^{-10}$
	M	0.04	$1.9 \cdot 10^{-9}$	0.02	$1.4 \cdot 10^{-9}$	$7.2 \cdot 10^{-10}$	$4.7 \cdot 10^{-10}$	$3.2 \cdot 10^{-10}$	$2.6 \cdot 10^{-10}$
Hg-194 org.	F	0.8	$4.9 \cdot 10^{-8}$	0.4	$3.7 \cdot 10^{-8}$	$2.4 \cdot 10^{-8}$	$1.9 \cdot 10^{-8}$	$1.5 \cdot 10^{-8}$	$1.4 \cdot 10^{-8}$
Hg-194 anorg.	F	0.04	$3.2 \cdot 10^{-8}$	0.02	$2.9 \cdot 10^{-8}$	$2.0 \cdot 10^{-8}$	$1.6 \cdot 10^{-8}$	$1.4 \cdot 10^{-8}$	$1.3 \cdot 10^{-8}$
	M	0.04	$2.1 \cdot 10^{-8}$	0.02	$1.9 \cdot 10^{-8}$	$1.3 \cdot 10^{-8}$	$1.0 \cdot 10^{-8}$	$8.9 \cdot 10^{-9}$	$8.3 \cdot 10^{-9}$
Hg-195 org.	F	0.8	$2.0 \cdot 10^{-10}$	0.4	$1.8 \cdot 10^{-10}$	$8.5 \cdot 10^{-11}$	$5.1 \cdot 10^{-11}$	$2.8 \cdot 10^{-11}$	$2.3 \cdot 10^{-11}$
Hg-195 anorg.	F	0.04	$2.7 \cdot 10^{-10}$	0.02	$2.0 \cdot 10^{-10}$	$9.5 \cdot 10^{-11}$	$5.7 \cdot 10^{-11}$	$3.1 \cdot 10^{-11}$	$2.5 \cdot 10^{-11}$
	M	0.04	$5.3 \cdot 10^{-10}$	0.02	$3.9 \cdot 10^{-10}$	$2.0 \cdot 10^{-10}$	$1.3 \cdot 10^{-10}$	$9.0 \cdot 10^{-11}$	$7.3 \cdot 10^{-11}$
Hg-195m org.	F	0.8	$1.1 \cdot 10^{-9}$	0.4	$9.7 \cdot 10^{-10}$	$4.4 \cdot 10^{-10}$	$2.7 \cdot 10^{-10}$	$1.4 \cdot 10^{-10}$	$1.2 \cdot 10^{-10}$
Hg-195m anorg.	F	0.04	$1.6 \cdot 10^{-9}$	0.02	$1.1 \cdot 10^{-9}$	$5.1 \cdot 10^{-10}$	$3.1 \cdot 10^{-10}$	$1.7 \cdot 10^{-10}$	$1.4 \cdot 10^{-10}$
	M	0.04	$3.7 \cdot 10^{-9}$	0.02	$2.6 \cdot 10^{-9}$	$1.4 \cdot 10^{-9}$	$8.5 \cdot 10^{-10}$	$6.7 \cdot 10^{-10}$	$5.3 \cdot 10^{-10}$
Hg-197 org.	F	0.8	$4.7 \cdot 10^{-10}$	0.4	$4.0 \cdot 10^{-10}$	$1.8 \cdot 10^{-10}$	$1.1 \cdot 10^{-10}$	$5.8 \cdot 10^{-11}$	$4.7 \cdot 10^{-11}$
Hg-197 anorg.	F	0.04	$6.8 \cdot 10^{-10}$	0.02	$4.7 \cdot 10^{-10}$	$2.1 \cdot 10^{-10}$	$1.3 \cdot 10^{-10}$	$6.8 \cdot 10^{-11}$	$5.6 \cdot 10^{-11}$
	M	0.04	$1.7 \cdot 10^{-9}$	0.02	$1.2 \cdot 10^{-9}$	$6.6 \cdot 10^{-10}$	$4.6 \cdot 10^{-10}$	$3.8 \cdot 10^{-10}$	$3.0 \cdot 10^{-10}$
Hg-197m org.	F	0.8	$9.3 \cdot 10^{-10}$	0.4	$7.8 \cdot 10^{-10}$	$3.4 \cdot 10^{-10}$	$2.1 \cdot 10^{-10}$	$1.1 \cdot 10^{-10}$	$9.6 \cdot 10^{-11}$
Hg-197m anorg.	F	0.04	$1.4 \cdot 10^{-9}$	0.02	$9.3 \cdot 10^{-10}$	$4.0 \cdot 10^{-10}$	$2.5 \cdot 10^{-10}$	$1.3 \cdot 10^{-10}$	$1.1 \cdot 10^{-10}$
	M	0.04	$3.5 \cdot 10^{-9}$	0.02	$2.5 \cdot 10^{-9}$	$1.1 \cdot 10^{-9}$	$8.2 \cdot 10^{-10}$	$6.7 \cdot 10^{-10}$	$5.3 \cdot 10^{-10}$
Hg-199m org.	F	0.8	$1.4 \cdot 10^{-10}$	0.4	$9.6 \cdot 10^{-11}$	$4.2 \cdot 10^{-11}$	$2.7 \cdot 10^{-11}$	$1.7 \cdot 10^{-11}$	$1.5 \cdot 10^{-11}$
Hg-199m anorg.	F	0.04	$1.4 \cdot 10^{-10}$	0.02	$9.6 \cdot 10^{-11}$	$4.2 \cdot 10^{-11}$	$2.7 \cdot 10^{-11}$	$1.7 \cdot 10^{-11}$	$1.5 \cdot 10^{-11}$
	M	0.04	$2.5 \cdot 10^{-10}$	0.02	$1.7 \cdot 10^{-10}$	$7.9 \cdot 10^{-11}$	$5.4 \cdot 10^{-11}$	$3.8 \cdot 10^{-11}$	$3.2 \cdot 10^{-11}$
Hg-203 org.	F	0.8	$5.7 \cdot 10^{-9}$	0.4	$3.7 \cdot 10^{-9}$	$1.7 \cdot 10^{-9}$	$1.1 \cdot 10^{-9}$	$6.6 \cdot 10^{-10}$	$5.6 \cdot 10^{-10}$
Hg-203 anorg.	F	0.04	$4.2 \cdot 10^{-9}$	0.02	$2.9 \cdot 10^{-9}$	$1.4 \cdot 10^{-9}$	$9.0 \cdot 10^{-10}$	$5.5 \cdot 10^{-10}$	$4.6 \cdot 10^{-10}$
	M	0.04	$1.0 \cdot 10^{-8}$	0.02	$7.9 \cdot 10^{-9}$	$4.7 \cdot 10^{-9}$	$3.4 \cdot 10^{-9}$	$3.0 \cdot 10^{-9}$	$2.4 \cdot 10^{-9}$
thallium									
Tl-194	F	1.0	$3.6 \cdot 10^{-11}$	1.0	$3.0 \cdot 10^{-11}$	$1.5 \cdot 10^{-11}$	$9.2 \cdot 10^{-12}$	$5.5 \cdot 10^{-12}$	$4.4 \cdot 10^{-12}$
Tl-194m	F	1.0	$1.7 \cdot 10^{-10}$	1.0	$1.2 \cdot 10^{-10}$	$6.1 \cdot 10^{-11}$	$3.8 \cdot 10^{-11}$	$2.3 \cdot 10^{-11}$	$1.9 \cdot 10^{-11}$
Tl-195	F	1.0	$1.3 \cdot 10^{-10}$	1.0	$1.0 \cdot 10^{-10}$	$5.3 \cdot 10^{-11}$	$3.2 \cdot 10^{-11}$	$1.9 \cdot 10^{-11}$	$1.5 \cdot 10^{-11}$
Tl-197	F	1.0	$1.3 \cdot 10^{-10}$	1.0	$9.7 \cdot 10^{-11}$	$4.7 \cdot 10^{-11}$	$2.9 \cdot 10^{-11}$	$1.7 \cdot 10^{-11}$	$1.4 \cdot 10^{-11}$
Tl-198	F	1.0	$4.7 \cdot 10^{-10}$	1.0	$4.0 \cdot 10^{-10}$	$2.1 \cdot 10^{-10}$	$1.3 \cdot 10^{-10}$	$7.5 \cdot 10^{-11}$	$6.0 \cdot 10^{-11}$
Tl-198m	F	1.0	$3.2 \cdot 10^{-10}$	1.0	$2.5 \cdot 10^{-10}$	$1.2 \cdot 10^{-10}$	$7.5 \cdot 10^{-11}$	$4.5 \cdot 10^{-11}$	$3.7 \cdot 10^{-11}$
Tl-199	F	1.0	$1.7 \cdot 10^{-10}$	1.0	$1.3 \cdot 10^{-10}$	$6.4 \cdot 10^{-11}$	$3.9 \cdot 10^{-11}$	$2.3 \cdot 10^{-11}$	$1.9 \cdot 10^{-11}$
Tl-200	F	1.0	$1.0 \cdot 10^{-9}$	1.0	$8.7 \cdot 10^{-10}$	$4.6 \cdot 10^{-10}$	$2.8 \cdot 10^{-10}$	$1.6 \cdot 10^{-10}$	$1.3 \cdot 10^{-10}$
Tl-201	F	1.0	$4.5 \cdot 10^{-10}$	1.0	$3.3 \cdot 10^{-10}$	$1.5 \cdot 10^{-10}$	$9.4 \cdot 10^{-11}$	$5.4 \cdot 10^{-11}$	$4.4 \cdot 10^{-11}$
Tl-202	F	1.0	$1.5 \cdot 10^{-9}$	1.0	$1.2 \cdot 10^{-9}$	$5.9 \cdot 10^{-10}$	$3.8 \cdot 10^{-10}$	$2.3 \cdot 10^{-10}$	$1.9 \cdot 10^{-10}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Tl-204	F	1.0	$5.0.10^{-9}$	1.0	$3.3.10^{-9}$	$1.5.10^{-9}$	$8.8.10^{-10}$	$4.7.10^{-10}$	$3.9.10^{-10}$
lead									
Pb-195m	F	0.6	$1.3.10^{-10}$	0.4**	$1.0.10^{-10}$	$4.9.10^{-11}$	$3.1.10^{-11}$	$1.9.10^{-11}$	$1.6.10^{-11}$
	M	0.2	$2.0.10^{-10}$	0.1	$1.5.10^{-10}$	$7.1.10^{-11}$	$4.6.10^{-11}$	$3.1.10^{-11}$	$2.5.10^{-11}$
	S	0.02	$2.1.10^{-10}$	0.01	$1.5.10^{-10}$	$7.4.10^{-11}$	$4.8.10^{-11}$	$3.2.10^{-11}$	$2.7.10^{-11}$
Pb-198	F	0.6	$3.4.10^{-10}$	0.4**	$2.9.10^{-10}$	$1.5.10^{-10}$	$8.9.10^{-11}$	$5.2.10^{-11}$	$4.3.10^{-11}$
	M	0.2	$5.0.10^{-10}$	0.1	$4.0.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$8.3.10^{-11}$	$6.6.10^{-11}$
	S	0.02	$5.4.10^{-10}$	0.01	$4.2.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$8.7.10^{-11}$	$7.0.10^{-11}$
Pb-199	F	0.6	$1.9.10^{-10}$	0.4**	$1.6.10^{-10}$	$8.2.10^{-11}$	$4.9.10^{-11}$	$2.9.10^{-11}$	$2.3.10^{-11}$
	M	0.2	$2.8.10^{-10}$	0.1	$2.2.10^{-10}$	$1.1.10^{-10}$	$7.1.10^{-11}$	$4.5.10^{-11}$	$3.6.10^{-11}$
	S	0.02	$2.9.10^{-10}$	0.01	$2.3.10^{-10}$	$1.2.10^{-10}$	$7.4.10^{-11}$	$4.7.10^{-11}$	$3.7.10^{-11}$
Pb-200	F	0.6	$1.1.10^{-9}$	0.4**	$9.3.10^{-10}$	$4.6.10^{-10}$	$2.8.10^{-10}$	$1.6.10^{-10}$	$1.4.10^{-10}$
	M	0.2	$2.2.10^{-9}$	0.1	$1.7.10^{-9}$	$8.6.10^{-10}$	$5.7.10^{-10}$	$4.1.10^{-10}$	$3.3.10^{-10}$
	S	0.02	$2.4.10^{-9}$	0.01	$1.8.10^{-9}$	$9.2.10^{-10}$	$6.2.10^{-10}$	$4.4.10^{-10}$	$3.5.10^{-10}$
Pb-201	F	0.6	$4.8.10^{-10}$	0.4**	$4.1.10^{-10}$	$2.0.10^{-10}$	$1.2.10^{-10}$	$7.1.10^{-11}$	$6.0.10^{-11}$
	M	0.2	$8.0.10^{-10}$	0.1	$6.4.10^{-10}$	$3.3.10^{-10}$	$2.1.10^{-10}$	$1.4.10^{-10}$	$1.1.10^{-10}$
	S	0.02	$8.8.10^{-10}$	0.01	$6.7.10^{-10}$	$3.5.10^{-10}$	$2.2.10^{-10}$	$1.5.10^{-10}$	$1.2.10^{-10}$
Pb-202	F	0.6	$1.9.10^{-8}$	0.4**	$1.3.10^{-8}$	$8.9.10^{-9}$	$1.3.10^{-8}$	$1.8.10^{-8}$	$1.1.10^{-8}$
	M	0.2	$1.2.10^{-8}$	0.1	$8.9.10^{-9}$	$6.2.10^{-9}$	$6.7.10^{-9}$	$8.7.10^{-9}$	$6.3.10^{-9}$
	S	0.02	$2.8.10^{-8}$	0.01	$2.8.10^{-8}$	$2.0.10^{-8}$	$1.4.10^{-8}$	$1.3.10^{-8}$	$1.2.10^{-8}$
Pb-202m	F	0.6	$4.7.10^{-10}$	0.4**	$4.0.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$7.5.10^{-11}$	$6.2.10^{-11}$
	M	0.2	$6.9.10^{-10}$	0.1	$5.6.10^{-10}$	$2.9.10^{-10}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$9.5.10^{-11}$
	S	0.02	$7.3.10^{-10}$	0.01	$5.8.10^{-10}$	$3.0.10^{-10}$	$1.9.10^{-10}$	$1.3.10^{-10}$	$1.0.10^{-10}$
Pb-203	F	0.6	$7.2.10^{-10}$	0.4**	$5.8.10^{-10}$	$2.8.10^{-10}$	$1.7.10^{-10}$	$9.9.10^{-11}$	$8.5.10^{-11}$
	M	0.2	$1.3.10^{-9}$	0.1	$1.0.10^{-9}$	$5.4.10^{-10}$	$3.6.10^{-10}$	$2.5.10^{-10}$	$2.0.10^{-10}$
	S	0.02	$1.5.10^{-9}$	0.01	$1.1.10^{-9}$	$5.8.10^{-10}$	$3.8.10^{-10}$	$2.8.10^{-10}$	$2.2.10^{-10}$
Pb-205	F	0.6	$1.1.10^{-9}$	0.4**	$6.9.10^{-10}$	$4.0.10^{-10}$	$4.1.10^{-10}$	$4.3.10^{-10}$	$3.3.10^{-10}$
	M	0.2	$1.1.10^{-9}$	0.1	$7.7.10^{-10}$	$4.3.10^{-10}$	$3.2.10^{-10}$	$2.9.10^{-10}$	$2.5.10^{-10}$
	S	0.02	$2.9.10^{-9}$	0.01	$2.7.10^{-9}$	$1.7.10^{-9}$	$1.1.10^{-9}$	$9.2.10^{-10}$	$8.5.10^{-10}$
Pb-209	F	0.6	$1.8.10^{-10}$	0.4**	$1.2.10^{-10}$	$5.3.10^{-11}$	$3.4.10^{-11}$	$1.9.10^{-11}$	$1.7.10^{-11}$
	M	0.2	$4.0.10^{-10}$	0.1	$2.7.10^{-10}$	$1.3.10^{-10}$	$9.2.10^{-11}$	$6.9.10^{-11}$	$5.6.10^{-11}$
	S	0.02	$4.4.10^{-10}$	0.01	$2.9.10^{-10}$	$1.4.10^{-10}$	$9.9.10^{-11}$	$7.5.10^{-11}$	$6.1.10^{-11}$
Pb-210	F	0.6	$4.7.10^{-6}$	0.4**	$2.9.10^{-6}$	$1.5.10^{-6}$	$1.4.10^{-6}$	$1.3.10^{-6}$	$9.0.10^{-7}$
	M	0.2	$5.0.10^{-6}$	0.1	$3.7.10^{-6}$	$2.2.10^{-6}$	$1.5.10^{-6}$	$1.3.10^{-6}$	$1.1.10^{-6}$
	S	0.02	$1.8.10^{-5}$	0.01	$1.8.10^{-5}$	$1.1.10^{-5}$	$7.2.10^{-6}$	$5.9.10^{-6}$	$5.6.10^{-6}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Pb-211	F	0.6	$2.5.10^{-8}$	0.4**	$1.7.10^{-8}$	$8.7.10^{-9}$	$6.1.10^{-9}$	$4.6.10^{-9}$	$3.9.10^{-9}$
	M	0.2	$6.2.10^{-8}$	0.1	$4.5.10^{-8}$	$2.5.10^{-8}$	$1.9.10^{-8}$	$1.4.10^{-8}$	$1.1.10^{-8}$
	S	0.02	$6.6.10^{-8}$	0.01	$4.8.10^{-8}$	$2.7.10^{-8}$	$2.0.10^{-8}$	$1.5.10^{-8}$	$1.2.10^{-8}$
Pb-212	F	0.6	$1.9.10^{-7}$	0.4**	$1.2.10^{-7}$	$5.4.10^{-8}$	$3.5.10^{-8}$	$2.0.10^{-8}$	$1.8.10^{-8}$
	M	0.2	$6.2.10^{-7}$	0.1	$4.6.10^{-7}$	$3.0.10^{-7}$	$2.2.10^{-7}$	$2.2.10^{-7}$	$1.7.10^{-7}$
	S	0.02	$6.7.10^{-7}$	0.01	$5.0.10^{-7}$	$3.3.10^{-7}$	$2.5.10^{-7}$	$2.4.10^{-7}$	$1.9.10^{-7}$
Pb-214	F	0.6	$2.2.10^{-8}$	0.4**	$1.5.10^{-8}$	$6.9.10^{-9}$	$4.8.10^{-9}$	$3.3.10^{-9}$	$2.8.10^{-9}$
	M	0.2	$6.4.10^{-8}$	0.1	$4.6.10^{-8}$	$2.6.10^{-8}$	$1.9.10^{-8}$	$1.4.10^{-8}$	$1.4.10^{-8}$
	S	0.02	$6.9.10^{-8}$	0.01	$5.0.10^{-8}$	$2.8.10^{-8}$	$2.1.10^{-8}$	$1.5.10^{-8}$	$1.5.10^{-8}$
bismuth									
Bi-200	F	0.1	$1.9.10^{-10}$	0.05	$1.5.10^{-10}$	$7.4.10^{-11}$	$4.5.10^{-11}$	$2.7.10^{-11}$	$2.2.10^{-11}$
	M	0.1	$2.5.10^{-10}$	0.05	$1.9.10^{-10}$	$9.9.10^{-11}$	$6.3.10^{-11}$	$4.1.10^{-11}$	$3.3.10^{-11}$
Bi-201	F	0.1	$4.0.10^{-10}$	0.05	$3.1.10^{-10}$	$1.5.10^{-10}$	$9.3.10^{-11}$	$5.4.10^{-11}$	$4.4.10^{-11}$
	M	0.1	$5.5.10^{-10}$	0.05	$4.1.10^{-10}$	$2.0.10^{-10}$	$1.3.10^{-10}$	$8.3.10^{-11}$	$6.6.10^{-11}$
Bi-202	F	0.1	$3.4.10^{-10}$	0.05	$2.8.10^{-10}$	$1.5.10^{-10}$	$9.0.10^{-11}$	$5.3.10^{-11}$	$4.3.10^{-11}$
	M	0.1	$4.2.10^{-10}$	0.05	$3.4.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$6.9.10^{-11}$	$5.5.10^{-11}$
Bi-203	F	0.1	$1.5.10^{-9}$	0.05	$1.2.10^{-9}$	$6.4.10^{-10}$	$4.0.10^{-10}$	$2.3.10^{-10}$	$1.9.10^{-10}$
	M	0.1	$2.0.10^{-9}$	0.05	$1.6.10^{-9}$	$8.2.10^{-10}$	$5.3.10^{-10}$	$3.3.10^{-10}$	$2.6.10^{-10}$
Bi-205	F	0.1	$3.0.10^{-9}$	0.05	$2.4.10^{-9}$	$1.3.10^{-9}$	$8.0.10^{-10}$	$4.7.10^{-10}$	$3.8.10^{-10}$
	M	0.1	$5.5.10^{-9}$	0.05	$4.4.10^{-9}$	$2.5.10^{-9}$	$1.6.10^{-9}$	$1.2.10^{-9}$	$9.3.10^{-10}$
Bi-206	F	0.1	$6.1.10^{-9}$	0.05	$4.8.10^{-9}$	$2.5.10^{-9}$	$1.6.10^{-9}$	$9.1.10^{-10}$	$7.4.10^{-10}$
	M	0.1	$1.0.10^{-8}$	0.05	$8.0.10^{-9}$	$4.4.10^{-9}$	$2.9.10^{-9}$	$2.1.10^{-9}$	$1.7.10^{-9}$
Bi-207	F	0.1	$4.3.10^{-9}$	0.05	$3.3.10^{-9}$	$1.7.10^{-9}$	$1.0.10^{-9}$	$6.0.10^{-10}$	$4.9.10^{-10}$
	M	0.1	$2.3.10^{-8}$	0.05	$2.0.10^{-8}$	$1.2.10^{-8}$	$8.2.10^{-9}$	$6.5.10^{-9}$	$5.6.10^{-9}$
Bi-210	F	0.1	$1.1.10^{-8}$	0.05	$6.9.10^{-9}$	$3.2.10^{-9}$	$2.1.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$
	M	0.1	$3.9.10^{-7}$	0.05	$3.0.10^{-7}$	$1.9.10^{-7}$	$1.3.10^{-7}$	$1.1.10^{-7}$	$9.3.10^{-8}$
Bi-210m	F	0.1	$4.1.10^{-7}$	0.05	$2.6.10^{-7}$	$1.3.10^{-7}$	$8.3.10^{-8}$	$5.6.10^{-8}$	$4.6.10^{-8}$
	M	0.1	$1.5.10^{-5}$	0.05	$1.1.10^{-5}$	$7.0.10^{-6}$	$4.8.10^{-6}$	$4.1.10^{-6}$	$3.4.10^{-6}$
Bi-212	F	0.1	$6.5.10^{-8}$	0.05	$4.5.10^{-8}$	$2.1.10^{-8}$	$1.5.10^{-8}$	$1.0.10^{-8}$	$9.1.10^{-9}$
	M	0.1	$1.6.10^{-7}$	0.05	$1.1.10^{-7}$	$6.0.10^{-8}$	$4.4.10^{-8}$	$3.8.10^{-8}$	$3.1.10^{-8}$
Bi-213	F	0.1	$7.7.10^{-8}$	0.05	$5.3.10^{-8}$	$2.5.10^{-8}$	$1.7.10^{-8}$	$1.2.10^{-8}$	$1.0.10^{-8}$
	M	0.1	$1.6.10^{-7}$	0.05	$1.2.10^{-7}$	$6.0.10^{-8}$	$4.4.10^{-8}$	$3.6.10^{-8}$	$3.0.10^{-8}$
Bi-214	F	0.1	$5.0.10^{-8}$	0.05	$3.5.10^{-8}$	$1.6.10^{-8}$	$1.1.10^{-8}$	$8.2.10^{-9}$	$7.1.10^{-9}$
	M	0.1	$8.7.10^{-8}$	0.05	$6.1.10^{-8}$	$3.1.10^{-8}$	$2.2.10^{-8}$	$1.7.10^{-8}$	$1.4.10^{-8}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
polonium									
Po-203	F	0.2	$1.9.10^{-10}$	0.1	$1.5.10^{-10}$	$7.7.10^{-11}$	$4.7.10^{-11}$	$2.8.10^{-11}$	$2.3.10^{-11}$
	M	0.2	$2.7.10^{-10}$	0.1	$2.1.10^{-10}$	$1.1.10^{-10}$	$6.7.10^{-11}$	$4.3.10^{-11}$	$3.5.10^{-11}$
	S	0.02	$2.8.10^{-10}$	0.01	$2.2.10^{-10}$	$1.1.10^{-10}$	$7.0.10^{-11}$	$4.5.10^{-11}$	$3.6.10^{-11}$
Po-205	F	0.2	$2.6.10^{-10}$	0.1	$2.1.10^{-10}$	$1.1.10^{-10}$	$6.6.10^{-11}$	$4.1.10^{-11}$	$3.3.10^{-11}$
	M	0.2	$4.0.10^{-10}$	0.1	$3.1.10^{-10}$	$1.7.10^{-10}$	$1.1.10^{-10}$	$8.1.10^{-11}$	$6.5.10^{-11}$
	S	0.02	$4.2.10^{-10}$	0.01	$3.2.10^{-10}$	$1.8.10^{-10}$	$1.2.10^{-10}$	$8.5.10^{-11}$	$6.9.10^{-11}$
Po-207	F	0.2	$4.8.10^{-10}$	0.1	$4.0.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$7.3.10^{-11}$	$5.8.10^{-11}$
	M	0.2	$6.2.10^{-10}$	0.1	$5.1.10^{-10}$	$2.6.10^{-10}$	$1.6.10^{-10}$	$9.9.10^{-11}$	$7.8.10^{-11}$
	S	0.02	$6.6.10^{-10}$	0.01	$5.3.10^{-10}$	$2.7.10^{-10}$	$1.7.10^{-10}$	$1.0.10^{-10}$	$8.2.10^{-11}$
Po-210	F	0.2	$7.4.10^{-6}$	0.1	$4.8.10^{-6}$	$2.2.10^{-6}$	$1.3.10^{-6}$	$7.7.10^{-7}$	$6.1.10^{-7}$
	M	0.2	$1.5.10^{-5}$	0.1	$1.1.10^{-5}$	$6.7.10^{-6}$	$4.6.10^{-6}$	$4.0.10^{-6}$	$3.3.10^{-6}$
	S	0.02	$1.8.10^{-5}$	0.01	$1.4.10^{-5}$	$8.6.10^{-6}$	$5.9.10^{-6}$	$5.1.10^{-6}$	$4.3.10^{-6}$
astatine									
At-207	F	1.0	$2.4.10^{-9}$	1.0	$1.7.10^{-9}$	$8.9.10^{-10}$	$5.9.10^{-10}$	$4.0.10^{-10}$	$3.3.10^{-10}$
	M	1.0	$9.2.10^{-9}$	1.0	$6.7.10^{-9}$	$4.3.10^{-9}$	$3.1.10^{-9}$	$2.9.10^{-9}$	$2.3.10^{-9}$
At-211	F	1.0	$1.4.10^{-7}$	1.0	$9.7.10^{-8}$	$4.3.10^{-8}$	$2.8.10^{-8}$	$1.7.10^{-8}$	$1.6.10^{-8}$
	M	1.0	$5.2.10^{-7}$	1.0	$3.7.10^{-7}$	$1.9.10^{-7}$	$1.4.10^{-7}$	$1.3.10^{-7}$	$1.1.10^{-7}$
francium									
Fr-222	F	1.0	$9.1.10^{-8}$	1.0	$6.3.10^{-8}$	$3.0.10^{-8}$	$2.1.10^{-8}$	$1.6.10^{-8}$	$1.4.10^{-8}$
Fr-223	F	1.0	$1.1.10^{-8}$	1.0	$7.3.10^{-9}$	$3.2.10^{-9}$	$1.9.10^{-9}$	$1.0.10^{-9}$	$8.9.10^{-10}$
radium									
Ra-223	F	0.6	$3.0.10^{-6}$	0.3**	$1.0.10^{-6}$	$4.9.10^{-7}$	$4.0.10^{-7}$	$3.3.10^{-7}$	$1.2.10^{-7}$
	M	0.2	$2.8.10^{-5}$	0.1	$2.1.10^{-5}$	$1.3.10^{-5}$	$9.9.10^{-6}$	$9.4.10^{-6}$	$7.4.10^{-6}$
	S	0.02	$3.2.10^{-5}$	0.01	$2.4.10^{-5}$	$1.5.10^{-5}$	$1.1.10^{-5}$	$1.1.10^{-5}$	$8.7.10^{-6}$
Ra-224	F	0.6	$1.5.10^{-6}$	0.3**	$6.0.10^{-7}$	$2.9.10^{-7}$	$2.2.10^{-7}$	$1.7.10^{-7}$	$7.5.10^{-8}$
	M	0.2	$1.1.10^{-5}$	0.1	$8.2.10^{-6}$	$5.3.10^{-6}$	$3.9.10^{-6}$	$3.7.10^{-6}$	$3.0.10^{-6}$
	S	0.02	$1.2.10^{-5}$	0.01	$9.2.10^{-6}$	$5.9.10^{-6}$	$4.4.10^{-6}$	$4.2.10^{-6}$	$3.4.10^{-6}$
Ra-225	F	0.6	$4.0.10^{-6}$	0.3**	$1.2.10^{-6}$	$5.6.10^{-7}$	$4.6.10^{-7}$	$3.8.10^{-7}$	$1.3.10^{-7}$
	M	0.2	$2.4.10^{-5}$	0.1	$1.8.10^{-5}$	$1.1.10^{-5}$	$8.4.10^{-6}$	$7.9.10^{-6}$	$6.3.10^{-6}$
	S	0.02	$2.8.10^{-5}$	0.01	$2.2.10^{-5}$	$1.4.10^{-5}$	$1.0.10^{-5}$	$9.8.10^{-6}$	$7.7.10^{-6}$
Ra-226	F	0.6	$2.6.10^{-6}$	0.3**	$9.4.10^{-7}$	$5.5.10^{-7}$	$7.2.10^{-7}$	$1.3.10^{-6}$	$3.6.10^{-7}$
	M	0.2	$1.5.10^{-5}$	0.1	$1.1.10^{-5}$	$7.0.10^{-6}$	$4.9.10^{-6}$	$4.5.10^{-6}$	$3.5.10^{-6}$
	S	0.02	$3.4.10^{-5}$	0.01	$2.9.10^{-5}$	$1.9.10^{-5}$	$1.2.10^{-5}$	$1.0.10^{-5}$	$9.5.10^{-6}$
Ra-227	F	0.6	$1.5.10^{-9}$	0.3**	$1.2.10^{-9}$	$7.8.10^{-10}$	$6.1.10^{-10}$	$5.3.10^{-10}$	$4.6.10^{-10}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
	M	0.2	$8.0.10^{-10}$	0.1	$6.7.10^{-10}$	$4.4.10^{-10}$	$3.2.10^{-10}$	$2.9.10^{-10}$	$2.8.10^{-10}$
	S	0.02	$1.0.10^{-9}$	0.01	$8.5.10^{-10}$	$4.4.10^{-10}$	$2.9.10^{-10}$	$2.4.10^{-10}$	$2.2.10^{-10}$
Ra-228	F	0.6	$1.7.10^{-5}$	0.3**	$5.7.10^{-6}$	$3.1.10^{-6}$	$3.6.10^{-6}$	$4.6.10^{-6}$	$9.0.10^{-7}$
	M	0.2	$1.5.10^{-5}$	0.1	$1.0.10^{-5}$	$6.3.10^{-6}$	$4.6.10^{-6}$	$4.4.10^{-6}$	$2.6.10^{-6}$
	S	0.02	$4.9.10^{-5}$	0.01	$4.8.10^{-5}$	$3.2.10^{-5}$	$2.0.10^{-5}$	$1.6.10^{-5}$	$1.6.10^{-5}$
actinium									
Ac-224	F	0.005	$1.3.10^{-7}$	$5.0.10^{-4}$	$8.9.10^{-8}$	$4.7.10^{-8}$	$3.1.10^{-8}$	$1.4.10^{-8}$	$1.1.10^{-8}$
	M	0.005	$4.2.10^{-7}$	$5.0.10^{-4}$	$3.2.10^{-7}$	$2.0.10^{-7}$	$1.5.10^{-7}$	$1.4.10^{-7}$	$1.1.10^{-7}$
	S	0.005	$4.6.10^{-7}$	$5.0.10^{-4}$	$3.5.10^{-7}$	$2.2.10^{-7}$	$1.7.10^{-7}$	$1.6.10^{-7}$	$1.3.10^{-7}$
Ac-225	F	0.005	$1.1.10^{-5}$	$5.0.10^{-4}$	$7.7.10^{-6}$	$4.0.10^{-6}$	$2.6.10^{-6}$	$1.1.10^{-6}$	$8.8.10^{-7}$
	M	0.005	$2.8.10^{-5}$	$5.0.10^{-4}$	$2.1.10^{-5}$	$1.3.10^{-5}$	$1.0.10^{-5}$	$9.3.10^{-6}$	$7.4.10^{-6}$
	S	0.005	$3.1.10^{-5}$	$5.0.10^{-4}$	$2.3.10^{-5}$	$1.5.10^{-5}$	$1.1.10^{-5}$	$1.1.10^{-5}$	$8.5.10^{-6}$
Ac-226	F	0.005	$1.5.10^{-6}$	$5.0.10^{-4}$	$1.1.10^{-6}$	$4.0.10^{-7}$	$2.6.10^{-7}$	$1.2.10^{-7}$	$9.6.10^{-8}$
	M	0.005	$4.3.10^{-6}$	$5.0.10^{-4}$	$3.2.10^{-6}$	$2.1.10^{-6}$	$1.5.10^{-6}$	$1.5.10^{-6}$	$1.2.10^{-6}$
	S	0.005	$4.7.10^{-6}$	$5.0.10^{-4}$	$3.5.10^{-6}$	$2.3.10^{-6}$	$1.7.10^{-6}$	$1.6.10^{-6}$	$1.3.10^{-6}$
Ac-227	F	0.005	$1.7.10^{-3}$	$5.0.10^{-4}$	$1.6.10^{-3}$	$1.0.10^{-3}$	$7.2.10^{-4}$	$5.6.10^{-4}$	$5.5.10^{-4}$
	M	0.005	$5.7.10^{-4}$	$5.0.10^{-4}$	$5.5.10^{-4}$	$3.9.10^{-4}$	$2.6.10^{-4}$	$2.3.10^{-4}$	$2.2.10^{-4}$
	S	0.005	$2.2.10^{-4}$	$5.0.10^{-4}$	$2.0.10^{-4}$	$1.3.10^{-4}$	$8.7.10^{-5}$	$7.6.10^{-5}$	$7.2.10^{-5}$
Ac-228	F	0.005	$1.8.10^{-7}$	$5.0.10^{-4}$	$1.6.10^{-7}$	$9.7.10^{-8}$	$5.7.10^{-8}$	$2.9.10^{-8}$	$2.5.10^{-8}$
	M	0.005	$8.4.10^{-8}$	$5.0.10^{-4}$	$7.3.10^{-8}$	$4.7.10^{-8}$	$2.9.10^{-8}$	$2.0.10^{-8}$	$1.7.10^{-8}$
	S	0.005	$6.4.10^{-8}$	$5.0.10^{-4}$	$5.3.10^{-8}$	$3.3.10^{-8}$	$2.2.10^{-8}$	$1.9.10^{-8}$	$1.6.10^{-8}$
thorium									
Th-226	F	0.005	$1.4.10^{-7}$	$5.0.10^{-4}$	$1.0.10^{-7}$	$4.8.10^{-8}$	$3.4.10^{-8}$	$2.5.10^{-8}$	$2.2.10^{-8}$
	M	0.005	$3.0.10^{-7}$	$5.0.10^{-4}$	$2.1.10^{-7}$	$1.1.10^{-7}$	$8.3.10^{-8}$	$7.0.10^{-8}$	$5.8.10^{-8}$
	S	0.005	$3.1.10^{-7}$	$5.0.10^{-4}$	$2.2.10^{-7}$	$1.2.10^{-7}$	$8.8.10^{-8}$	$7.5.10^{-8}$	$6.1.10^{-8}$
Th-227	F	0.005	$8.4.10^{-6}$	$5.0.10^{-4}$	$5.2.10^{-6}$	$2.6.10^{-6}$	$1.6.10^{-6}$	$1.0.10^{-6}$	$6.7.10^{-7}$
	M	0.005	$3.2.10^{-5}$	$5.0.10^{-4}$	$2.5.10^{-5}$	$1.6.10^{-5}$	$1.1.10^{-5}$	$1.1.10^{-5}$	$8.5.10^{-6}$
	S	0.005	$3.9.10^{-5}$	$5.0.10^{-4}$	$3.0.10^{-5}$	$1.9.10^{-5}$	$1.4.10^{-5}$	$1.3.10^{-5}$	$1.0.10^{-5}$
Th-228	F	0.005	$1.8.10^{-4}$	$5.0.10^{-4}$	$1.5.10^{-4}$	$8.3.10^{-5}$	$5.2.10^{-5}$	$3.5.10^{-5}$	$3.0.10^{-5}$
	M	0.005	$1.3.10^{-4}$	$5.0.10^{-4}$	$1.1.10^{-4}$	$6.8.10^{-5}$	$4.6.10^{-5}$	$3.9.10^{-5}$	$3.2.10^{-5}$
	S	0.005	$1.6.10^{-4}$	$5.0.10^{-4}$	$1.3.10^{-4}$	$8.2.10^{-5}$	$5.5.10^{-5}$	$4.7.10^{-5}$	$4.0.10^{-5}$
Th-229	F	0.005	$5.4.10^{-4}$	$5.0.10^{-4}$	$5.1.10^{-4}$	$3.6.10^{-4}$	$2.9.10^{-4}$	$2.4.10^{-4}$	$2.4.10^{-4}$
	M	0.005	$2.3.10^{-4}$	$5.0.10^{-4}$	$2.1.10^{-4}$	$1.6.10^{-4}$	$1.2.10^{-4}$	$1.1.10^{-4}$	$1.1.10^{-4}$
	S	0.005	$2.1.10^{-4}$	$5.0.10^{-4}$	$1.9.10^{-4}$	$1.3.10^{-4}$	$8.7.10^{-5}$	$7.6.10^{-5}$	$7.1.10^{-5}$
Th-230	F	0.005	$2.1.10^{-4}$	$5.0.10^{-4}$	$2.0.10^{-4}$	$1.4.10^{-4}$	$1.1.10^{-4}$	$9.9.10^{-5}$	$1.0.10^{-4}$

Element	**Type**	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
	M	0.005	$7.7.10^{-5}$	$5.0.10^{-4}$	$7.4.10^{-5}$	$5.5.10^{-5}$	$4.3.10^{-5}$	$4.2.10^{-5}$	$4.3.10^{-5}$
	S	0.005	$4.0.10^{-5}$	$5.0.10^{-4}$	$3.5.10^{-5}$	$2.4.10^{-5}$	$1.6.10^{-5}$	$1.5.10^{-5}$	$1.4.10^{-5}$
Th-231	F	0.005	$1.1.10^{-9}$	$5.0.10^{-4}$	$7.2.10^{-10}$	$2.6.10^{-10}$	$1.6.10^{-10}$	$9.2.10^{-11}$	$7.8.10^{-11}$
	M	0.005	$2.2.10^{-9}$	$5.0.10^{-4}$	$1.6.10^{-9}$	$8.0.10^{-10}$	$4.8.10^{-10}$	$3.8.10^{-10}$	$3.1.10^{-10}$
	S	0.005	$2.4.10^{-9}$	$5.0.10^{-4}$	$1.7.10^{-9}$	$7.6.10^{-10}$	$5.2.10^{-10}$	$4.1.10^{-10}$	$3.3.10^{-10}$
Th-232	F	0.005	$2.3.10^{-4}$	$5.0.10^{-4}$	$2.2.10^{-4}$	$1.6.10^{-4}$	$1.3.10^{-4}$	$1.2.10^{-4}$	$1.1.10^{-4}$
	M	0.005	$8.3.10^{-5}$	$5.0.10^{-4}$	$8.1.10^{-5}$	$6.3.10^{-5}$	$5.0.10^{-5}$	$4.7.10^{-5}$	$4.5.10^{-5}$
	S	0.005	$5.4.10^{-5}$	$5.0.10^{-4}$	$5.0.10^{-5}$	$3.7.10^{-5}$	$2.6.10^{-5}$	$2.5.10^{-5}$	$2.5.10^{-5}$
Th-234	F	0.005	$4.0.10^{-8}$	$5.0.10^{-4}$	$2.5.10^{-8}$	$1.1.10^{-8}$	$6.1.10^{-9}$	$3.5.10^{-9}$	$2.5.10^{-9}$
	M	0.005	$3.9.10^{-8}$	$5.0.10^{-4}$	$2.9.10^{-8}$	$1.5.10^{-8}$	$1.0.10^{-8}$	$7.9.10^{-9}$	$6.6.10^{-9}$
	S	0.005	$4.1.10^{-8}$	$5.0.10^{-4}$	$3.1.10^{-8}$	$1.7.10^{-8}$	$1.1.10^{-8}$	$9.1.10^{-9}$	$7.7.10^{-9}$
protactinium									
Pa-227	M	0.005	$3.6.10^{-7}$	$5.0.10^{-4}$	$2.6.10^{-7}$	$1.4.10^{-7}$	$1.0.10^{-7}$	$9.0.10^{-8}$	$7.4.10^{-8}$
	S	0.005	$3.8.10^{-7}$	$5.0.10^{-4}$	$2.8.10^{-7}$	$1.5.10^{-7}$	$1.1.10^{-7}$	$8.1.10^{-8}$	$8.0.10^{-8}$
Pa-228	M	0.005	$2.6.10^{-7}$	$5.0.10^{-4}$	$2.1.10^{-7}$	$1.3.10^{-7}$	$8.8.10^{-8}$	$7.7.10^{-8}$	$6.4.10^{-8}$
	S	0.005	$2.9.10^{-7}$	$5.0.10^{-4}$	$2.4.10^{-7}$	$1.5.10^{-7}$	$1.0.10^{-7}$	$9.1.10^{-8}$	$7.5.10^{-8}$
Pa-230	M	0.005	$2.4.10^{-6}$	$5.0.10^{-4}$	$1.8.10^{-6}$	$1.1.10^{-6}$	$8.3.10^{-7}$	$7.6.10^{-7}$	$6.1.10^{-7}$
	S	0.005	$2.9.10^{-6}$	$5.0.10^{-4}$	$2.2.10^{-6}$	$1.4.10^{-6}$	$1.0.10^{-6}$	$9.6.10^{-7}$	$7.6.10^{-7}$
Pa-231	M	0.005	$2.2.10^{-4}$	$5.0.10^{-4}$	$2.3.10^{-4}$	$1.9.10^{-4}$	$1.5.10^{-4}$	$1.5.10^{-4}$	$1.4.10^{-4}$
	S	0.005	$7.4.10^{-5}$	$5.0.10^{-4}$	$6.9.10^{-5}$	$5.2.10^{-5}$	$3.9.10^{-5}$	$3.6.10^{-5}$	$3.4.10^{-5}$
Pa-232	M	0.005	$1.9.10^{-8}$	$5.0.10^{-4}$	$1.8.10^{-8}$	$1.4.10^{-8}$	$1.1.10^{-8}$	$1.0.10^{-8}$	$1.0.10^{-8}$
	S	0.005	$1.0.10^{-8}$	$5.0.10^{-4}$	$8.7.10^{-9}$	$5.9.10^{-9}$	$4.1.10^{-9}$	$3.7.10^{-9}$	$3.5.10^{-9}$
Pa-233	M	0.005	$1.5.10^{-8}$	$5.0.10^{-4}$	$1.1.10^{-8}$	$6.5.10^{-9}$	$4.7.10^{-9}$	$4.1.10^{-9}$	$3.3.10^{-9}$
	S	0.005	$1.7.10^{-8}$	$5.0.10^{-4}$	$1.3.10^{-8}$	$7.5.10^{-9}$	$5.5.10^{-9}$	$4.9.10^{-9}$	$3.9.10^{-9}$
Pa-234	M	0.005	$2.8.10^{-9}$	$5.0.10^{-4}$	$2.0.10^{-9}$	$1.0.10^{-9}$	$6.8.10^{-10}$	$4.7.10^{-10}$	$3.8.10^{-10}$
	S	0.005	$2.9.10^{-9}$	$5.0.10^{-4}$	$2.1.10^{-9}$	$1.1.10^{-9}$	$7.1.10^{-10}$	$5.0.10^{-10}$	$4.0.10^{-10}$
uranium									
U-230	F	0.04	$3.2.10^{-6}$	0.02	$1.5.10^{-6}$	$7.2.10^{-7}$	$5.4.10^{-7}$	$4.1.10^{-7}$	$3.8.10^{-7}$
	M	0.04	$4.9.10^{-5}$	0.02	$3.7.10^{-5}$	$2.4.10^{-5}$	$1.8.10^{-5}$	$1.7.10^{-5}$	$1.3.10^{-5}$
	S	0.02	$5.8.10^{-5}$	0.002	$4.4.10^{-5}$	$2.8.10^{-5}$	$2.1.10^{-5}$	$2.0.10^{-5}$	$1.6.10^{-5}$
U-231	F	0.04	$1.0.10^{-9}$	0.02	$6.8.10^{-10}$	$3.2.10^{-10}$	$1.5.10^{-10}$	$1.0.10^{-10}$	$6.4.10^{-11}$
	M	0.04	$2.5.10^{-9}$	0.02	$2.0.10^{-9}$	$1.0.10^{-9}$	$6.9.10^{-10}$	$5.7.10^{-10}$	$4.7.10^{-10}$
	S	0.02	$2.7.10^{-9}$	0.002	$2.0.10^{-9}$	$1.1.10^{-9}$	$7.7.10^{-10}$	$6.3.10^{-10}$	$5.2.10^{-10}$
U-232	F	0.04	$1.6.10^{-5}$	0.02	$1.0.10^{-5}$	$6.9.10^{-6}$	$6.8.10^{-6}$	$7.5.10^{-6}$	$4.0.10^{-6}$
	M	0.04	$3.0.10^{-5}$	0.02	$2.4.10^{-5}$	$1.6.10^{-5}$	$1.1.10^{-5}$	$1.0.10^{-5}$	$7.8.10^{-6}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
	S	0.02	$1.0.10^{-4}$	0.002	$9.7.10^{-5}$	$6.6.10^{-5}$	$4.3.10^{-5}$	$3.8.10^{-5}$	$3.7.10^{-5}$
U-233	F	0.04	$2.2.10^{-6}$	0.02	$1.4.10^{-6}$	$9.4.10^{-7}$	$8.4.10^{-7}$	$8.6.10^{-7}$	$5.8.10^{-7}$
	M	0.04	$1.5.10^{-5}$	0.02	$1.1.10^{-5}$	$7.2.10^{-6}$	$4.9.10^{-6}$	$4.3.10^{-6}$	$3.6.10^{-6}$
	S	0.02	$3.4.10^{-5}$	0.002	$3.0.10^{-5}$	$1.9.10^{-5}$	$1.2.10^{-5}$	$1.1.10^{-5}$	$9.6.10^{-6}$
U-234	F	0.04	$2.1.10^{-6}$	0.02	$1.4.10^{-6}$	$9.0.10^{-7}$	$8.0.10^{-7}$	$8.2.10^{-7}$	$5.6.10^{-7}$
	M	0.04	$1.5.10^{-5}$	0.02	$1.1.10^{-5}$	$7.0.10^{-6}$	$4.8.10^{-6}$	$4.2.10^{-6}$	$3.5.10^{-6}$
	S	0.02	$3.3.10^{-5}$	0.002	$2.9.10^{-5}$	$1.9.10^{-5}$	$1.2.10^{-5}$	$1.0.10^{-5}$	$9.4.10^{-6}$
U-235	F	0.04	$2.0.10^{-6}$	0.02	$1.3.10^{-6}$	$8.5.10^{-7}$	$7.5.10^{-7}$	$7.7.10^{-7}$	$5.2.10^{-7}$
	M	0.04	$1.3.10^{-5}$	0.02	$1.0.10^{-5}$	$6.3.10^{-6}$	$4.3.10^{-6}$	$3.7.10^{-6}$	$3.1.10^{-6}$
	S	0.02	$3.0.10^{-5}$	0.002	$2.6.10^{-5}$	$1.7.10^{-5}$	$1.1.10^{-5}$	$9.2.10^{-6}$	$8.5.10^{-6}$
U-236	F	0.04	$2.0.10^{-6}$	0.02	$1.3.10^{-6}$	$8.5.10^{-7}$	$7.5.10^{-7}$	$7.8.10^{-7}$	$5.3.10^{-7}$
	M	0.04	$1.4.10^{-5}$	0.02	$1.0.10^{-5}$	$6.5.10^{-6}$	$4.5.10^{-6}$	$3.9.10^{-6}$	$3.2.10^{-6}$
	S	0.02	$3.1.10^{-5}$	0.002	$2.7.10^{-5}$	$1.8.10^{-5}$	$1.1.10^{-5}$	$9.5.10^{-6}$	$8.7.10^{-6}$
U-237	F	0.04	$1.8.10^{-9}$	0.02	$1.5.10^{-9}$	$6.6.10^{-10}$	$4.2.10^{-10}$	$1.9.10^{-10}$	$1.8.10^{-10}$
	M	0.04	$7.8.10^{-9}$	0.02	$5.7.10^{-9}$	$3.3.10^{-9}$	$2.4.10^{-9}$	$2.1.10^{-9}$	$1.7.10^{-9}$
	S	0.02	$8.7.10^{-9}$	0.002	$6.4.10^{-9}$	$3.7.10^{-9}$	$2.7.10^{-9}$	$2.4.10^{-9}$	$1.9.10^{-9}$
U-238	F	0.04	$1.9.10^{-6}$	0.02	$1.3.10^{-6}$	$8.2.10^{-7}$	$7.3.10^{-7}$	$7.4.10^{-7}$	$5.0.10^{-7}$
	M	0.04	$1.2.10^{-5}$	0.02	$9.4.10^{-6}$	$5.9.10^{-6}$	$4.0.10^{-6}$	$3.4.10^{-6}$	$2.9.10^{-6}$
	S	0.02	$2.9.10^{-5}$	0.002	$2.5.10^{-5}$	$1.6.10^{-5}$	$1.0.10^{-5}$	$8.7.10^{-6}$	$8.0.10^{-6}$
U-239	F	0.04	$1.0.10^{-10}$	0.02	$6.6.10^{-11}$	$2.9.10^{-11}$	$1.9.10^{-11}$	$1.2.10^{-11}$	$1.0.10^{-11}$
	M	0.04	$1.8.10^{-10}$	0.02	$1.2.10^{-10}$	$5.6.10^{-11}$	$3.8.10^{-11}$	$2.7.10^{-11}$	$2.2.10^{-11}$
	S	0.02	$1.9.10^{-10}$	0.002	$1.2.10^{-10}$	$5.9.10^{-11}$	$4.0.10^{-11}$	$2.9.10^{-11}$	$2.4.10^{-11}$
U-240	F	0.04	$2.4.10^{-9}$	0.02	$1.6.10^{-9}$	$7.1.10^{-10}$	$4.5.10^{-10}$	$2.3.10^{-10}$	$2.0.10^{-10}$
	M	0.04	$4.6.10^{-9}$	0.02	$3.1.10^{-9}$	$1.7.10^{-9}$	$1.1.10^{-9}$	$6.5.10^{-10}$	$5.3.10^{-10}$
	S	0.02	$4.9.10^{-9}$	0.002	$3.3.10^{-9}$	$1.6.10^{-9}$	$1.1.10^{-9}$	$7.0.10^{-10}$	$5.8.10^{-10}$
neptunium									
Np-232	F	0.005	$2.0.10^{-10}$	$5.0.10^{-4}$	$1.9.10^{-10}$	$1.2.10^{-10}$	$1.1.10^{-10}$	$1.1.10^{-10}$	$1.2.10^{-10}$
	M	0.005	$8.9.10^{-11}$	$5.0.10^{-4}$	$8.1.10^{-11}$	$5.5.10^{-11}$	$4.5.10^{-11}$	$4.7.10^{-11}$	$5.0.10^{-11}$
	S	0.005	$1.2.10^{-10}$	$5.0.10^{-4}$	$9.7.10^{-11}$	$5.8.10^{-11}$	$3.9.10^{-11}$	$2.5.10^{-11}$	$2.4.10^{-11}$
Np-233	F	0.005	$1.1.10^{-11}$	$5.0.10^{-4}$	$8.7.10^{-12}$	$4.2.10^{-12}$	$2.5.10^{-12}$	$1.4.10^{-12}$	$1.1.10^{-12}$
	M	0.005	$1.5.10^{-11}$	$5.0.10^{-4}$	$1.1.10^{-11}$	$5.5.10^{-12}$	$3.3.10^{-12}$	$2.1.10^{-12}$	$1.6.10^{-12}$
	S	0.005	$1.5.10^{-11}$	$5.0.10^{-4}$	$1.2.10^{-11}$	$5.7.10^{-12}$	$3.4.10^{-12}$	$2.1.10^{-12}$	$1.7.10^{-12}$
Np-234	F	0.005	$2.9.10^{-9}$	$5.0.10^{-4}$	$2.2.10^{-9}$	$1.1.10^{-9}$	$7.2.10^{-10}$	$4.3.10^{-10}$	$3.5.10^{-10}$
	M	0.005	$3.8.10^{-9}$	$5.0.10^{-4}$	$3.0.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$6.5.10^{-10}$	$5.3.10^{-10}$
	S	0.005	$3.9.10^{-9}$	$5.0.10^{-4}$	$3.1.10^{-9}$	$1.6.10^{-9}$	$1.0.10^{-9}$	$6.8.10^{-10}$	$5.5.10^{-10}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Np-235	F	0.005	$4.2.10^{-9}$	$5.0.10^{-4}$	$3.5.10^{-9}$	$1.9.10^{-9}$	$1.1.10^{-9}$	$7.5.10^{-10}$	$6.3.10^{-10}$
	M	0.005	$2.3.10^{-9}$	$5.0.10^{-4}$	$1.9.10^{-9}$	$1.1.10^{-9}$	$6.8.10^{-10}$	$5.1.10^{-10}$	$4.2.10^{-10}$
	S	0.005	$2.6.10^{-9}$	$5.0.10^{-4}$	$2.2.10^{-9}$	$1.3.10^{-9}$	$8.3.10^{-10}$	$6.3.10^{-10}$	$5.2.10^{-10}$
Np-236	F	0.005	$8.9.10^{-6}$	$5.0.10^{-4}$	$9.1.10^{-6}$	$7.2.10^{-6}$	$7.5.10^{-6}$	$7.9.10^{-6}$	$8.0.10^{-6}$
	M	0.005	$3.0.10^{-6}$	$5.0.10^{-4}$	$3.1.10^{-6}$	$2.7.10^{-6}$	$2.7.10^{-6}$	$3.1.10^{-6}$	$3.2.10^{-6}$
	S	0.005	$1.6.10^{-6}$	$5.0.10^{-4}$	$1.6.10^{-6}$	$1.3.10^{-6}$	$1.0.10^{-6}$	$1.0.10^{-6}$	$1.0.10^{-6}$
Np-236m	F	0.005	$2.8.10^{-8}$	$5.0.10^{-4}$	$2.6.10^{-8}$	$1.5.10^{-8}$	$1.1.10^{-8}$	$8.9.10^{-9}$	$9.0.10^{-9}$
	M	0.005	$1.6.10^{-8}$	$5.0.10^{-4}$	$1.4.10^{-8}$	$8.9.10^{-9}$	$6.2.10^{-9}$	$5.6.10^{-9}$	$5.3.10^{-9}$
	S	0.005	$1.6.10^{-8}$	$5.0.10^{-4}$	$1.3.10^{-8}$	$8.5.10^{-9}$	$5.7.10^{-9}$	$4.8.10^{-9}$	$4.2.10^{-9}$
Np-237	F	0.005	$9.8.10^{-5}$	$5.0.10^{-4}$	$9.3.10^{-5}$	$6.0.10^{-5}$	$5.0.10^{-5}$	$4.7.10^{-5}$	$5.0.10^{-5}$
	M	0.005	$4.4.10^{-5}$	$5.0.10^{-4}$	$4.0.10^{-5}$	$2.8.10^{-5}$	$2.2.10^{-5}$	$2.2.10^{-5}$	$2.3.10^{-5}$
	S	0.005	$3.7.10^{-5}$	$5.0.10^{-4}$	$3.2.10^{-5}$	$2.1.10^{-5}$	$1.4.10^{-5}$	$1.3.10^{-5}$	$1.2.10^{-5}$
Np-238	F	0.005	$9.0.10^{-9}$	$5.0.10^{-4}$	$7.9.10^{-9}$	$4.8.10^{-9}$	$3.7.10^{-9}$	$3.3.10^{-9}$	$3.5.10^{-9}$
	M	0.005	$7.3.10^{-9}$	$5.0.10^{-4}$	$5.8.10^{-9}$	$3.4.10^{-9}$	$2.5.10^{-9}$	$2.2.10^{-9}$	$2.1.10^{-9}$
	S	0.005	$8.1.10^{-9}$	$5.0.10^{-4}$	$6.2.10^{-9}$	$3.2.10^{-9}$	$2.1.10^{-9}$	$1.7.10^{-9}$	$1.5.10^{-9}$
Np-239	F	0.005	$2.6.10^{-9}$	$5.0.10^{-4}$	$1.4.10^{-9}$	$6.3.10^{-10}$	$3.8.10^{-10}$	$2.1.10^{-10}$	$1.7.10^{-10}$
	M	0.005	$5.9.10^{-9}$	$5.0.10^{-4}$	$4.2.10^{-9}$	$2.0.10^{-9}$	$1.4.10^{-9}$	$1.2.10^{-9}$	$9.3.10^{-10}$
	S	0.005	$5.6.10^{-9}$	$5.0.10^{-4}$	$4.0.10^{-9}$	$2.2.10^{-9}$	$1.6.10^{-9}$	$1.3.10^{-9}$	$1.0.10^{-9}$
Np-240	F	0.005	$3.6.10^{-10}$	$5.0.10^{-4}$	$2.6.10^{-10}$	$1.2.10^{-10}$	$7.7.10^{-11}$	$4.7.10^{-11}$	$4.0.10^{-11}$
	M	0.005	$6.3.10^{-10}$	$5.0.10^{-4}$	$4.4.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$1.0.10^{-10}$	$8.5.10^{-11}$
	S	0.005	$6.5.10^{-10}$	$5.0.10^{-4}$	$4.6.10^{-10}$	$2.3.10^{-10}$	$1.5.10^{-10}$	$1.1.10^{-10}$	$9.0.10^{-11}$
plutonium									
Pu-234	F	0.005	$3.0.10^{-8}$	$5.0.10^{-4}$	$2.0.10^{-8}$	$9.8.10^{-9}$	$5.7.10^{-9}$	$3.6.10^{-9}$	$3.0.10^{-9}$
	M	0.005	$7.8.10^{-8}$	$5.0.10^{-4}$	$5.9.10^{-8}$	$3.7.10^{-8}$	$2.8.10^{-8}$	$2.6.10^{-8}$	$2.1.10^{-8}$
	S	$1.0.10^{-4}$	$8.7.10^{-8}$	$1.0.10^{-5}$	$6.6.10^{-8}$	$4.2.10^{-8}$	$3.1.10^{-8}$	$3.0.10^{-8}$	$2.4.10^{-8}$
Pu-235	F	0.005	$1.0.10^{-11}$	$5.0.10^{-4}$	$7.9.10^{-12}$	$3.9.10^{-12}$	$2.2.10^{-12}$	$1.3.10^{-12}$	$1.0.10^{-12}$
	M	0.005	$1.3.10^{-11}$	$5.0.10^{-4}$	$1.0.10^{-11}$	$5.0.10^{-12}$	$2.9.10^{-12}$	$1.9.10^{-12}$	$1.4.10^{-12}$
	S	$1.0.10^{-4}$	$1.3.10^{-11}$	$1.0.10^{-5}$	$1.0.10^{-11}$	$5.1.10^{-12}$	$3.0.10^{-12}$	$1.9.10^{-12}$	$1.5.10^{-12}$
Pu-236	F	0.005	$1.0.10^{-4}$	$5.0.10^{-4}$	$9.5.10^{-5}$	$6.1.10^{-5}$	$4.4.10^{-5}$	$3.7.10^{-5}$	$4.0.10^{-5}$
	M	0.005	$4.8.10^{-5}$	$5.0.10^{-4}$	$4.3.10^{-5}$	$2.9.10^{-5}$	$2.1.10^{-5}$	$1.9.10^{-5}$	$2.0.10^{-5}$
	S	$1.0.10^{-4}$	$3.6.10^{-5}$	$1.0.10^{-5}$	$3.1.10^{-5}$	$2.0.10^{-5}$	$1.4.10^{-5}$	$1.2.10^{-5}$	$1.0.10^{-5}$
Pu-237	F	0.005	$2.2.10^{-9}$	$5.0.10^{-4}$	$1.6.10^{-9}$	$7.9.10^{-10}$	$4.8.10^{-10}$	$2.9.10^{-10}$	$2.6.10^{-10}$
	M	0.005	$1.9.10^{-9}$	$5.0.10^{-4}$	$1.4.10^{-9}$	$8.2.10^{-10}$	$5.4.10^{-10}$	$4.3.10^{-10}$	$3.5.10^{-10}$
	S	$1.0.10^{-4}$	$2.0.10^{-9}$	$1.0.10^{-5}$	$1.5.10^{-9}$	$8.8.10^{-10}$	$5.9.10^{-10}$	$4.8.10^{-10}$	$3.9.10^{-10}$
Pu-238	F	0.005	$2.0.10^{-4}$	$5.0.10^{-4}$	$1.9.10^{-4}$	$1.4.10^{-4}$	$1.1.10^{-4}$	$1.0.10^{-4}$	$1.1.10^{-4}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
	M	0.005	$7.8.10^{-5}$	$5.0.10^{-4}$	$7.4.10^{-5}$	$5.6.10^{-5}$	$4.4.10^{-5}$	$4.3.10^{-5}$	$4.6.10^{-5}$
	S	$1.0.10^{-4}$	$4.5.10^{-5}$	$1.0.10^{-5}$	$4.0.10^{-5}$	$2.7.10^{-5}$	$1.9.10^{-5}$	$1.7.10^{-5}$	$1.6.10^{-5}$
Pu-239	F	0.005	$2.1.10^{-4}$	$5.0.10^{-4}$	$2.0.10^{-4}$	$1.5.10^{-4}$	$1.2.10^{-4}$	$1.1.10^{-4}$	$1.2.10^{-4}$
	M	0.005	$8.0.10^{-5}$	$5.0.10^{-4}$	$7.7.10^{-5}$	$6.0.10^{-5}$	$4.8.10^{-5}$	$4.7.10^{-5}$	$5.0.10^{-5}$
	S	$1.0.10^{-4}$	$4.3.10^{-5}$	$1.0.10^{-5}$	$3.9.10^{-5}$	$2.7.10^{-5}$	$1.9.10^{-5}$	$1.7.10^{-5}$	$1.6.10^{-5}$
Pu-240	F	0.005	$2.1.10^{-4}$	$5.0.10^{-4}$	$2.0.10^{-4}$	$1.5.10^{-4}$	$1.2.10^{-4}$	$1.1.10^{-4}$	$1.2.10^{-4}$
	M	0.005	$8.0.10^{-5}$	$5.0.10^{-4}$	$7.7.10^{-5}$	$6.0.10^{-5}$	$4.8.10^{-5}$	$4.7.10^{-5}$	$5.0.10^{-5}$
	S	$1.0.10^{-4}$	$4.3.10^{-5}$	$1.0.10^{-5}$	$3.9.10^{-5}$	$2.7.10^{-5}$	$1.9.10^{-5}$	$1.7.10^{-5}$	$1.6.10^{-5}$
Pu-241	F	0.005	$2.8.10^{-6}$	$5.0.10^{-4}$	$2.9.10^{-6}$	$2.6.10^{-6}$	$2.4.10^{-6}$	$2.2.10^{-6}$	$2.3.10^{-6}$
	M	0.005	$9.1.10^{-7}$	$5.0.10^{-4}$	$9.7.10^{-7}$	$9.2.10^{-7}$	$8.3.10^{-7}$	$8.6.10^{-7}$	$9.0.10^{-7}$
	S	$1.0.10^{-4}$	$2.2.10^{-7}$	$1.0.10^{-5}$	$2.3.10^{-7}$	$2.0.10^{-7}$	$1.7.10^{-7}$	$1.7.10^{-7}$	$1.7.10^{-7}$
Pu-242	F	0.005	$2.0.10^{-4}$	$5.0.10^{-4}$	$1.9.10^{-4}$	$1.4.10^{-4}$	$1.2.10^{-4}$	$1.1.10^{-4}$	$1.1.10^{-4}$
	M	0.005	$7.6.10^{-5}$	$5.0.10^{-4}$	$7.3.10^{-5}$	$5.7.10^{-5}$	$4.5.10^{-5}$	$4.5.10^{-5}$	$4.8.10^{-5}$
	S	$1.0.10^{-4}$	$4.0.10^{-5}$	$1.0.10^{-5}$	$3.6.10^{-5}$	$2.5.10^{-5}$	$1.7.10^{-5}$	$1.6.10^{-5}$	$1.5.10^{-5}$
Pu-243	F	0.005	$2.7.10^{-10}$	$5.0.10^{-4}$	$1.9.10^{-10}$	$8.8.10^{-11}$	$5.7.10^{-11}$	$3.5.10^{-11}$	$3.2.10^{-11}$
	M	0.005	$5.6.10^{-10}$	$5.0.10^{-4}$	$3.9.10^{-10}$	$1.9.10^{-10}$	$1.3.10^{-10}$	$8.7.10^{-11}$	$8.3.10^{-11}$
	S	$1.0.10^{-4}$	$6.0.10^{-10}$	$1.0.10^{-5}$	$4.1.10^{-10}$	$2.0.10^{-10}$	$1.4.10^{-10}$	$9.2.10^{-11}$	$8.6.10^{-11}$
Pu-244	F	0.005	$2.0.10^{-4}$	$5.0.10^{-4}$	$1.9.10^{-4}$	$1.4.10^{-4}$	$1.2.10^{-4}$	$1.1.10^{-4}$	$1.1.10^{-4}$
	M	0.005	$7.4.10^{-5}$	$5.0.10^{-4}$	$7.2.10^{-5}$	$5.6.10^{-5}$	$4.5.10^{-5}$	$4.4.10^{-5}$	$4.7.10^{-5}$
	S	$1.0.10^{-4}$	$3.9.10^{-5}$	$1.0.10^{-5}$	$3.5.10^{-5}$	$2.4.10^{-5}$	$1.7.10^{-5}$	$1.5.10^{-5}$	$1.5.10^{-5}$
Pu-245	F	0.005	$1.8.10^{-9}$	$5.0.10^{-4}$	$1.3.10^{-9}$	$5.6.10^{-10}$	$3.5.10^{-10}$	$1.9.10^{-10}$	$1.6.10^{-10}$
	M	0.005	$3.6.10^{-9}$	$5.0.10^{-4}$	$2.5.10^{-9}$	$1.2.10^{-9}$	$8.0.10^{-10}$	$5.0.10^{-10}$	$4.0.10^{-10}$
	S	$1.0.10^{-4}$	$3.8.10^{-9}$	$1.0.10^{-5}$	$2.6.10^{-9}$	$1.3.10^{-9}$	$8.5.10^{-10}$	$5.4.10^{-10}$	$4.3.10^{-10}$
Pu-246	F	0.005	$2.0.10^{-8}$	$5.0.10^{-4}$	$1.4.10^{-8}$	$7.0.10^{-9}$	$4.4.10^{-9}$	$2.8.10^{-9}$	$2.5.10^{-9}$
	M	0.005	$3.5.10^{-8}$	$5.0.10^{-4}$	$2.6.10^{-8}$	$1.5.10^{-8}$	$1.1.10^{-8}$	$9.1.10^{-9}$	$7.4.10^{-9}$
	S	$1.0.10^{-4}$	$3.8.10^{-8}$	$1.0.10^{-5}$	$2.8.10^{-8}$	$1.6.10^{-8}$	$1.2.10^{-8}$	$1.0.10^{-8}$	$8.0.10^{-9}$
americium									
Am-237	F	0.005	$9.8.10^{-11}$	$5.0.10^{-4}$	$7.3.10^{-11}$	$3.5.10^{-11}$	$2.2.10^{-11}$	$1.3.10^{-11}$	$1.1.10^{-11}$
	M	0.005	$1.7.10^{-10}$	$5.0.10^{-4}$	$1.2.10^{-10}$	$6.2.10^{-11}$	$4.1.10^{-11}$	$3.0.10^{-11}$	$2.5.10^{-11}$
	S	0.005	$1.7.10^{-10}$	$5.0.10^{-4}$	$1.3.10^{-10}$	$6.5.10^{-11}$	$4.3.10^{-11}$	$3.2.10^{-11}$	$2.6.10^{-11}$
Am-238	F	0.005	$4.1.10^{-10}$	$5.0.10^{-4}$	$3.8.10^{-10}$	$2.5.10^{-10}$	$2.0.10^{-10}$	$1.8.10^{-10}$	$1.9.10^{-10}$
	M	0.005	$3.1.10^{-10}$	$5.0.10^{-4}$	$2.6.10^{-10}$	$1.3.10^{-10}$	$9.6.10^{-11}$	$8.8.10^{-11}$	$9.0.10^{-11}$
	S	0.005	$2.7.10^{-10}$	$5.0.10^{-4}$	$2.2.10^{-10}$	$1.3.10^{-10}$	$8.2.10^{-11}$	$6.1.10^{-11}$	$5.4.10^{-11}$
Am-239	F	0.005	$8.1.10^{-10}$	$5.0.10^{-4}$	$5.8.10^{-10}$	$2.6.10^{-10}$	$1.6.10^{-10}$	$9.1.10^{-11}$	$7.6.10^{-11}$
	M	0.005	$1.5.10^{-9}$	$5.0.10^{-4}$	$1.1.10^{-9}$	$5.6.10^{-10}$	$3.7.10^{-10}$	$2.7.10^{-10}$	$2.2.10^{-10}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
	S	0.005	$1.6.10^{-9}$	$5.0.10^{-4}$	$1.1.10^{-9}$	$5.9.10^{-10}$	$4.0.10^{-10}$	$2.5.10^{-10}$	$2.4.10^{-10}$
Am-240	F	0.005	$2.0.10^{-9}$	$5.0.10^{-4}$	$1.7.10^{-9}$	$8.8.10^{-10}$	$5.7.10^{-10}$	$3.6.10^{-10}$	$2.3.10^{-10}$
	M	0.005	$2.9.10^{-9}$	$5.0.10^{-4}$	$2.2.10^{-9}$	$1.2.10^{-9}$	$7.7.10^{-10}$	$5.3.10^{-10}$	$4.3.10^{-10}$
	S	0.005	$3.0.10^{-9}$	$5.0.10^{-4}$	$2.3.10^{-9}$	$1.2.10^{-9}$	$7.8.10^{-10}$	$5.3.10^{-10}$	$4.3.10^{-10}$
Am-241	F	0.005	$1.8.10^{-4}$	$5.0.10^{-4}$	$1.8.10^{-4}$	$1.2.10^{-4}$	$1.0.10^{-4}$	$9.2.10^{-5}$	$9.6.10^{-5}$
	M	0.005	$7.3.10^{-5}$	$5.0.10^{-4}$	$6.9.10^{-5}$	$5.1.10^{-5}$	$4.0.10^{-5}$	$4.0.10^{-5}$	$4.2.10^{-5}$
	S	0.005	$4.6.10^{-5}$	$5.0.10^{-4}$	$4.0.10^{-5}$	$2.7.10^{-5}$	$1.9.10^{-5}$	$1.7.10^{-5}$	$1.6.10^{-5}$
Am-242	F	0.005	$9.2.10^{-8}$	$5.0.10^{-4}$	$7.1.10^{-8}$	$3.5.10^{-8}$	$2.1.10^{-8}$	$1.4.10^{-8}$	$1.1.10^{-8}$
	M	0.005	$7.6.10^{-8}$	$5.0.10^{-4}$	$5.9.10^{-8}$	$3.6.10^{-8}$	$2.4.10^{-8}$	$2.1.10^{-8}$	$1.7.10^{-8}$
	S	0.005	$8.0.10^{-8}$	$5.0.10^{-4}$	$6.2.10^{-8}$	$3.9.10^{-8}$	$2.7.10^{-8}$	$2.4.10^{-8}$	$2.0.10^{-8}$
Am-242m	F	0.005	$1.6.10^{-4}$	$5.0.10^{-4}$	$1.5.10^{-4}$	$1.1.10^{-4}$	$9.4.10^{-5}$	$8.8.10^{-5}$	$9.2.10^{-5}$
	M	0.005	$5.2.10^{-5}$	$5.0.10^{-4}$	$5.3.10^{-5}$	$4.1.10^{-5}$	$3.4.10^{-5}$	$3.5.10^{-5}$	$3.7.10^{-5}$
	S	0.005	$2.5.10^{-5}$	$5.0.10^{-4}$	$2.4.10^{-5}$	$1.7.10^{-5}$	$1.2.10^{-5}$	$1.1.10^{-5}$	$1.1.10^{-5}$
Am-243	F	0.005	$1.8.10^{-4}$	$5.0.10^{-4}$	$1.7.10^{-4}$	$1.2.10^{-4}$	$1.0.10^{-4}$	$9.1.10^{-5}$	$9.6.10^{-5}$
	M	0.005	$7.2.10^{-5}$	$5.0.10^{-4}$	$6.8.10^{-5}$	$5.0.10^{-5}$	$4.0.10^{-5}$	$4.0.10^{-5}$	$4.1.10^{-5}$
	S	0.005	$4.4.10^{-5}$	$5.0.10^{-4}$	$3.9.10^{-5}$	$2.6.10^{-5}$	$1.8.10^{-5}$	$1.6.10^{-5}$	$1.5.10^{-5}$
Am-244	F	0.005	$1.0.10^{-8}$	$5.0.10^{-4}$	$9.2.10^{-9}$	$5.6.10^{-9}$	$4.1.10^{-9}$	$3.5.10^{-9}$	$3.7.10^{-9}$
	M	0.005	$6.0.10^{-9}$	$5.0.10^{-4}$	$5.0.10^{-9}$	$3.2.10^{-9}$	$2.2.10^{-9}$	$2.0.10^{-9}$	$2.0.10^{-9}$
	S	0.005	$6.1.10^{-9}$	$5.0.10^{-4}$	$4.8.10^{-9}$	$2.4.10^{-9}$	$1.6.10^{-9}$	$1.4.10^{-9}$	$1.2.10^{-9}$
Am-244m	F	0.005	$4.6.10^{-10}$	$5.0.10^{-4}$	$4.0.10^{-10}$	$2.4.10^{-10}$	$1.8.10^{-10}$	$1.5.10^{-10}$	$1.6.10^{-10}$
	M	0.005	$3.3.10^{-10}$	$5.0.10^{-4}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$9.2.10^{-11}$	$8.3.10^{-11}$	$8.4.10^{-11}$
	S	0.005	$3.0.10^{-10}$	$5.0.10^{-4}$	$2.2.10^{-10}$	$1.2.10^{-10}$	$8.1.10^{-11}$	$5.5.10^{-11}$	$5.7.10^{-11}$
Am-245	F	0.005	$2.1.10^{-10}$	$5.0.10^{-4}$	$1.4.10^{-10}$	$6.2.10^{-11}$	$4.0.10^{-11}$	$2.4.10^{-11}$	$2.1.10^{-11}$
	M	0.005	$3.9.10^{-10}$	$5.0.10^{-4}$	$2.6.10^{-10}$	$1.3.10^{-10}$	$8.7.10^{-11}$	$6.4.10^{-11}$	$5.3.10^{-11}$
	S	0.005	$4.1.10^{-10}$	$5.0.10^{-4}$	$2.8.10^{-10}$	$1.3.10^{-10}$	$9.2.10^{-11}$	$6.8.10^{-11}$	$5.6.10^{-11}$
Am-246	F	0.005	$3.0.10^{-10}$	$5.0.10^{-4}$	$2.0.10^{-10}$	$9.3.10^{-11}$	$6.1.10^{-11}$	$3.8.10^{-11}$	$3.3.10^{-11}$
	M	0.005	$5.0.10^{-10}$	$5.0.10^{-4}$	$3.4.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$7.9.10^{-11}$	$6.6.10^{-11}$
	S	0.005	$5.3.10^{-10}$	$5.0.10^{-4}$	$3.6.10^{-10}$	$1.7.10^{-10}$	$1.2.10^{-10}$	$8.3.10^{-11}$	$6.9.10^{-11}$
Am-246m	F	0.005	$1.3.10^{-10}$	$5.0.10^{-4}$	$8.9.10^{-11}$	$4.2.10^{-11}$	$2.6.10^{-11}$	$1.6.10^{-11}$	$1.4.10^{-11}$
	M	0.005	$1.9.10^{-10}$	$5.0.10^{-4}$	$1.3.10^{-10}$	$6.1.10^{-11}$	$4.0.10^{-11}$	$2.6.10^{-11}$	$2.2.10^{-11}$
	S	0.005	$2.0.10^{-10}$	$5.0.10^{-4}$	$1.4.10^{-10}$	$6.4.10^{-11}$	$4.1.10^{-11}$	$2.7.10^{-11}$	$2.3.10^{-11}$
curium									
Cm-238	F	0.005	$7.7.10^{-9}$	$5.0.10^{-4}$	$5.4.10^{-9}$	$2.6.10^{-9}$	$1.8.10^{-9}$	$9.2.10^{-10}$	$7.8.10^{-10}$
	M	0.005	$2.1.10^{-8}$	$5.0.10^{-4}$	$1.5.10^{-8}$	$7.9.10^{-9}$	$5.9.10^{-9}$	$5.6.10^{-9}$	$4.5.10^{-9}$
	S	0.005	$2.2.10^{-8}$	$5.0.10^{-4}$	$1.6.10^{-8}$	$8.6.10^{-9}$	$6.4.10^{-9}$	$6.1.10^{-9}$	$4.9.10^{-9}$

Element	Type	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		Age < 1 year		> 1 year	1 year	5 years	10 years	15 years	adult
Cm-240	F	0.005	$8.3.10^{-6}$	$5.0.10^{-4}$	$6.3.10^{-6}$	$3.2.10^{-6}$	$2.0.10^{-6}$	$1.5.10^{-6}$	$1.3.10^{-6}$
	M	0.005	$1.2.10^{-5}$	$5.0.10^{-4}$	$9.1.10^{-6}$	$5.8.10^{-6}$	$4.2.10^{-6}$	$3.8.10^{-6}$	$3.2.10^{-6}$
	S	0.005	$1.3.10^{-5}$	$5.0.10^{-4}$	$9.9.10^{-6}$	$6.4.10^{-6}$	$4.6.10^{-6}$	$4.3.10^{-6}$	$3.5.10^{-6}$
Cm-241	F	0.005	$1.1.10^{-7}$	$5.0.10^{-4}$	$8.9.10^{-8}$	$4.9.10^{-8}$	$3.5.10^{-8}$	$2.8.10^{-8}$	$2.7.10^{-8}$
	M	0.005	$1.3.10^{-7}$	$5.0.10^{-4}$	$1.0.10^{-7}$	$6.6.10^{-8}$	$4.8.10^{-8}$	$4.4.10^{-8}$	$3.7.10^{-8}$
	S	0.005	$1.4.10^{-7}$	$5.0.10^{-4}$	$1.1.10^{-7}$	$6.9.10^{-8}$	$4.9.10^{-8}$	$4.5.10^{-8}$	$3.7.10^{-8}$
Cm-242	F	0.005	$2.7.10^{-5}$	$5.0.10^{-4}$	$2.1.10^{-5}$	$1.0.10^{-5}$	$6.1.10^{-6}$	$4.0.10^{-6}$	$3.3.10^{-6}$
	M	0.005	$2.2.10^{-5}$	$5.0.10^{-4}$	$1.8.10^{-5}$	$1.1.10^{-5}$	$7.3.10^{-6}$	$6.4.10^{-6}$	$5.2.10^{-6}$
	S	0.005	$2.4.10^{-5}$	$5.0.10^{-4}$	$1.9.10^{-5}$	$1.2.10^{-5}$	$8.2.10^{-6}$	$7.3.10^{-6}$	$5.9.10^{-6}$
Cm-243	F	0.005	$1.6.10^{-4}$	$5.0.10^{-4}$	$1.5.10^{-4}$	$9.5.10^{-5}$	$7.3.10^{-5}$	$6.5.10^{-5}$	$6.9.10^{-5}$
	M	0.005	$6.7.10^{-5}$	$5.0.10^{-4}$	$6.1.10^{-5}$	$4.2.10^{-5}$	$3.1.10^{-5}$	$3.0.10^{-5}$	$3.1.10^{-5}$
	S	0.005	$4.6.10^{-5}$	$5.0.10^{-4}$	$4.0.10^{-5}$	$2.6.10^{-5}$	$1.8.10^{-5}$	$1.6.10^{-5}$	$1.5.10^{-5}$
Cm-244	F	0.005	$1.5.10^{-4}$	$5.0.10^{-4}$	$1.3.10^{-4}$	$8.3.10^{-5}$	$6.1.10^{-5}$	$5.3.10^{-5}$	$5.7.10^{-5}$
	M	0.005	$6.2.10^{-5}$	$5.0.10^{-4}$	$5.7.10^{-5}$	$3.7.10^{-5}$	$2.7.10^{-5}$	$2.6.10^{-5}$	$2.7.10^{-5}$
	S	0.005	$4.4.10^{-5}$	$5.0.10^{-4}$	$3.8.10^{-5}$	$2.5.10^{-5}$	$1.7.10^{-5}$	$1.5.10^{-5}$	$1.3.10^{-5}$
Cm-245	F	0.005	$1.9.10^{-4}$	$5.0.10^{-4}$	$1.8.10^{-4}$	$1.2.10^{-4}$	$1.0.10^{-4}$	$9.4.10^{-5}$	$9.9.10^{-5}$
	M	0.005	$7.3.10^{-5}$	$5.0.10^{-4}$	$6.9.10^{-5}$	$5.1.10^{-5}$	$4.1.10^{-5}$	$4.1.10^{-5}$	$4.2.10^{-5}$
	S	0.005	$4.5.10^{-5}$	$5.0.10^{-4}$	$4.0.10^{-5}$	$2.7.10^{-5}$	$1.9.10^{-5}$	$1.7.10^{-5}$	$1.6.10^{-5}$
Cm-246	F	0.005	$1.9.10^{-4}$	$5.0.10^{-4}$	$1.8.10^{-4}$	$1.2.10^{-4}$	$1.0.10^{-4}$	$9.4.10^{-5}$	$9.8.10^{-5}$
	M	0.005	$7.3.10^{-5}$	$5.0.10^{-4}$	$6.9.10^{-5}$	$5.1.10^{-5}$	$4.1.10^{-5}$	$4.1.10^{-5}$	$4.2.10^{-5}$
	S	0.005	$4.6.10^{-5}$	$5.0.10^{-4}$	$4.0.10^{-5}$	$2.7.10^{-5}$	$1.9.10^{-5}$	$1.7.10^{-5}$	$1.6.10^{-5}$
Cm-247	F	0.005	$1.7.10^{-4}$	$5.0.10^{-4}$	$1.6.10^{-4}$	$1.1.10^{-4}$	$9.4.10^{-5}$	$8.6.10^{-5}$	$9.0.10^{-5}$
	M	0.005	$6.7.10^{-5}$	$5.0.10^{-4}$	$6.3.10^{-5}$	$4.7.10^{-5}$	$3.7.10^{-5}$	$3.7.10^{-5}$	$3.9.10^{-5}$
	S	0.005	$4.1.10^{-5}$	$5.0.10^{-4}$	$3.6.10^{-5}$	$2.4.10^{-5}$	$1.7.10^{-5}$	$1.5.10^{-5}$	$1.4.10^{-5}$
Cm-248	F	0.005	$6.8.10^{-4}$	$5.0.10^{-4}$	$6.5.10^{-4}$	$4.5.10^{-4}$	$3.7.10^{-4}$	$3.4.10^{-4}$	$3.6.10^{-4}$
	M	0.005	$2.5.10^{-4}$	$5.0.10^{-4}$	$2.4.10^{-4}$	$1.8.10^{-4}$	$1.4.10^{-4}$	$1.4.10^{-4}$	$1.5.10^{-4}$
	S	0.005	$1.4.10^{-4}$	$5.0.10^{-4}$	$1.2.10^{-4}$	$8.2.10^{-5}$	$5.6.10^{-5}$	$5.0.10^{-5}$	$4.8.10^{-5}$
Cm-249	F	0.005	$1.8.10^{-10}$	$5.0.10^{-4}$	$9.8.10^{-11}$	$5.9.10^{-11}$	$4.6.10^{-11}$	$4.0.10^{-11}$	$4.0.10^{-11}$
	M	0.005	$2.4.10^{-10}$	$5.0.10^{-4}$	$1.6.10^{-10}$	$8.2.10^{-11}$	$5.8.10^{-11}$	$3.7.10^{-11}$	$3.3.10^{-11}$
	S	0.005	$2.4.10^{-10}$	$5.0.10^{-4}$	$1.6.10^{-10}$	$7.8.10^{-11}$	$5.3.10^{-11}$	$3.9.10^{-11}$	$3.3.10^{-11}$
Cm-250	F	0.005	$3.9.10^{-3}$	$5.0.10^{-4}$	$3.7.10^{-3}$	$2.6.10^{-3}$	$2.1.10^{-3}$	$2.0.10^{-3}$	$2.1.10^{-3}$
	M	0.005	$1.4.10^{-3}$	$5.0.10^{-4}$	$1.3.10^{-3}$	$9.9.10^{-4}$	$7.9.10^{-4}$	$7.9.10^{-4}$	$8.4.10^{-4}$
	S	0.005	$7.2.10^{-4}$	$5.0.10^{-4}$	$6.5.10^{-4}$	$4.4.10^{-4}$	$3.0.10^{-4}$	$2.7.10^{-4}$	$2.6.10^{-4}$
berkelium									
Bk-245	M	0.005	$8.8.10^{-9}$	$5.0.10^{-4}$	$6.6.10^{-9}$	$4.0.10^{-9}$	$2.9.10^{-9}$	$2.6.10^{-9}$	$2.1.10^{-9}$

Element	**Type**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**> 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Bk-246	M	0.005	$2.1.10^{-9}$	$5.0.10^{-4}$	$1.7.10^{-9}$	$9.3.10^{-10}$	$6.0.10^{-10}$	$4.0.10^{-10}$	$3.3.10^{-10}$
Bk-247	M	0.005	$1.5.10^{-4}$	$5.0.10^{-4}$	$1.5.10^{-4}$	$1.1.10^{-4}$	$7.9.10^{-5}$	$7.2.10^{-5}$	$6.9.10^{-5}$
Bk-249	M	0.005	$3.3.10^{-7}$	$5.0.10^{-4}$	$3.3.10^{-7}$	$2.4.10^{-7}$	$1.8.10^{-7}$	$1.6.10^{-7}$	$1.6.10^{-7}$
Bk-250	M	0.005	$3.4.10^{-9}$	$5.0.10^{-4}$	$3.1.10^{-9}$	$2.0.10^{-9}$	$1.3.10^{-9}$	$1.1.10^{-9}$	$1.0.10^{-9}$
californium									
Cf-244	M	0.005	$7.6.10^{-8}$	$5.0.10^{-4}$	$5.4.10^{-8}$	$2.8.10^{-8}$	$2.0.10^{-8}$	$1.6.10^{-8}$	$1.4.10^{-8}$
Cf-246	M	0.005	$1.7.10^{-6}$	$5.0.10^{-4}$	$1.3.10^{-6}$	$8.3.10^{-7}$	$6.1.10^{-7}$	$5.7.10^{-7}$	$4.5.10^{-7}$
Cf-248	M	0.005	$3.8.10^{-5}$	$5.0.10^{-4}$	$3.2.10^{-5}$	$2.1.10^{-5}$	$1.4.10^{-5}$	$1.0.10^{-5}$	$8.8.10^{-6}$
Cf-249	M	0.005	$1.6.10^{-4}$	$5.0.10^{-4}$	$1.5.10^{-4}$	$1.1.10^{-4}$	$8.0.10^{-5}$	$7.2.10^{-5}$	$7.0.10^{-5}$
Cf-250	M	0.005	$1.1.10^{-4}$	$5.0.10^{-4}$	$9.8.10^{-5}$	$6.6.10^{-5}$	$4.2.10^{-5}$	$3.5.10^{-5}$	$3.4.10^{-5}$
Cf-251	M	0.005	$1.6.10^{-4}$	$5.0.10^{-4}$	$1.5.10^{-4}$	$1.1.10^{-4}$	$8.1.10^{-5}$	$7.3.10^{-5}$	$7.1.10^{-5}$
Cf-252	M	0.005	$9.7.10^{-5}$	$5.0.10^{-4}$	$8.7.10^{-5}$	$5.6.10^{-5}$	$3.2.10^{-5}$	$2.2.10^{-5}$	$2.0.10^{-5}$
Cf-253	M	0.005	$5.4.10^{-6}$	$5.0.10^{-4}$	$4.2.10^{-6}$	$2.6.10^{-6}$	$1.9.10^{-6}$	$1.7.10^{-6}$	$1.3.10^{-6}$
Cf-254	M	0.005	$2.5.10^{-4}$	$5.0.10^{-4}$	$1.9.10^{-4}$	$1.1.10^{-4}$	$7.0.10^{-5}$	$4.8.10^{-5}$	$4.1.10^{-5}$
einsteinium									
Es-250m	M	0.005	$2.0.10^{-9}$	$5.0.10^{-4}$	$1.8.10^{-9}$	$1.2.10^{-9}$	$7.8.10^{-10}$	$6.4.10^{-10}$	$6.3.10^{-10}$
Es-251	M	0.005	$7.9.10^{-9}$	$5.0.10^{-4}$	$6.0.10^{-9}$	$3.9.10^{-9}$	$2.8.10^{-9}$	$2.6.10^{-9}$	$2.1.10^{-9}$
Es-253	M	0.005	$1.1.10^{-5}$	$5.0.10^{-4}$	$8.0.10^{-6}$	$5.1.10^{-6}$	$3.7.10^{-6}$	$3.4.10^{-6}$	$2.7.10^{-6}$
Es-254	M	0.005	$3.7.10^{-5}$	$5.0.10^{-4}$	$3.1.10^{-5}$	$2.0.10^{-5}$	$1.3.10^{-5}$	$1.0.10^{-5}$	$8.6.10^{-6}$
Es-254m	M	0.005	$1.7.10^{-6}$	$5.0.10^{-4}$	$1.3.10^{-6}$	$8.4.10^{-7}$	$6.3.10^{-7}$	$5.9.10^{-7}$	$4.7.10^{-7}$
fermium									
Fm-252	M	0.005	$1.2.10^{-6}$	$5.0.10^{-4}$	$9.0.10^{-7}$	$5.8.10^{-7}$	$4.3.10^{-7}$	$4.0.10^{-7}$	$3.2.10^{-7}$
Fm-253	M	0.005	$1.5.10^{-6}$	$5.0.10^{-4}$	$1.2.10^{-6}$	$7.3.10^{-7}$	$5.4.10^{-7}$	$5.0.10^{-7}$	$4.0.10^{-7}$
Fm-254	M	0.005	$3.2.10^{-7}$	$5.0.10^{-4}$	$2.3.10^{-7}$	$1.3.10^{-7}$	$9.8.10^{-8}$	$7.6.10^{-8}$	$6.1.10^{-8}$
Fm-255	M	0.005	$1.2.10^{-6}$	$5.0.10^{-4}$	$7.3.10^{-7}$	$4.7.10^{-7}$	$3.5.10^{-7}$	$3.4.10^{-7}$	$2.7.10^{-7}$
Fm-257	M	0.005	$3.3.10^{-5}$	$5.0.10^{-4}$	$2.6.10^{-5}$	$1.6.10^{-5}$	$1.1.10^{-5}$	$8.8.10^{-6}$	$7.1.10^{-6}$
mendelevium									
Md-257	M	0.005	$1.0.10^{-7}$	$5.0.10^{-4}$	$8.2.10^{-8}$	$5.1.10^{-8}$	$3.6.10^{-8}$	$3.1.10^{-8}$	$2.5.10^{-8}$
Md-258	M	0.005	$2.4.10^{-5}$	$5.0.10^{-4}$	$1.9.10^{-5}$	$1.2.10^{-5}$	$8.6.10^{-6}$	$7.3.10^{-6}$	$5.9.10^{-6}$

Legend:
* - For adults $f_1 = 0.1$
** - For adults $f_1 = 0.2$
^{X} - For adults $f_1 = 0.3$

Conversion factors h_{inh} listed in the table are used to convert intake of radionuclides to the committed effective dose for inhalation of radioactive aerosols by an individual from the population.
Conversion factors h_{inh} for intake via inhalation are listed depending on the type of absorption in the lungs.

For unidentified radionuclides and chemical forms of radioactive substances or characteristics of inhaled aerosol, activity is attributed to those radionuclides and their forms or such an aerosol for which the table stipulates the highest conversion factor.

Conversion factors h_{inh} for intake of radioactive fumes by inhalation by an individual from the population or radiation worker

Element	**Substance**	f_1	h_{inh} [Sv/Bq]	f_1	h_{inh} [Sv/Bq]				
Nuclide		**Age < 1 year**		**≥ 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
hydrogen									
H-3	org. bound	1.0	$1.1.10^{-10}$	1.0	$1.1.10^{-10}$	$7.0.10^{-11}$	$5.5.10^{-11}$	$4.1.10^{-11}$	$4.1.10^{-11}$
	HT	1.0	$6.4.10^{-15}$	1.0	$4.8.10^{-15}$	$3.1.10^{-15}$	$2.3.10^{-15}$	$1.8.10^{-15}$	$1.8.10^{-15}$
	CH_3T	1.0	$6.4.10^{-13}$	1.0	$4.8.10^{-13}$	$3.1.10^{-13}$	$2.3.10^{-13}$	$1.8.10^{-13}$	$1.8.10^{-13}$
	tritiated water vapour	1.0	$6.4.10^{-11}$	1.0	$4.8.10^{-11}$	$3.1.10^{-11}$	$2.3.10^{-11}$	$1.8.10^{-11}$	$1.8.10^{-11}$
carbon									
C-11	CO_2	1.0	$1.8.10^{-11}$	1.0	$1.2.10^{-11}$	$6.5.10^{-12}$	$4.1.10^{-12}$	$2.5.10^{-12}$	$2.2.10^{-12}$
	CO	1.0	$1.0.10^{-11}$	1.0	$6.7.10^{-12}$	$3.5.10^{-12}$	$2.2.10^{-12}$	$1.4.10^{-12}$	$1.2.10^{-12}$
	CH_4	1.0	$2.3.10^{-13}$	1.0	$1.5.10^{-13}$	$8.1.10^{-14}$	$5.1.10^{-14}$	$3.2.10^{-14}$	$2.7.10^{-14}$
	vapours	1.0[a]	$2.8.10^{-11}$	1.0	$1.8.10^{-11}$	$9.7.10^{-12}$	$6.1.10^{-12}$	$3.8.10^{-12}$	$3.2.10^{-12}$
C-14	CO_2	1.0	$1.9.10^{-11}$	1.0	$1.9.10^{-11}$	$1.1.10^{-11}$	$8.9.10^{-12}$	$6.3.10^{-12}$	$6.2.10^{-12}$
	CO	1.0	$9.1.10^{-12}$	1.0	$5.7.10^{-12}$	$2.8.10^{-12}$	$1.7.10^{-12}$	$9.9.10^{-13}$	$8.0.10^{-13}$
	CH_4	1.0	$6.6.10^{-12}$	1.0	$7.8.10^{-12}$	$4.9.10^{-12}$	$4.0.10^{-12}$	$2.9.10^{-12}$	$2.9.10^{-12}$
	vapours	1.0[a]	$1.3.10^{-09}$	1.0	$1.6.10^{-09}$	$9.7.10^{-10}$	$7.9.10^{-10}$	$5.7.10^{-10}$	$5.8.10^{-10}$
sulphur									
S-35	SO_2	1.0	$9.4.10^{-10}$	0.8	$6.6.10^{-10}$	$3.4.10^{-10}$	$2.1.10^{-10}$	$1.3.10^{-10}$	$1.1.10^{-10}$
	CS_2	1.0	$6.9.10^{-09}$	0.8	$4.8.10^{-09}$	$2.4.10^{-09}$	$1.4.10^{-09}$	$8.6.10^{-10}$	$7.0.10^{-10}$
nickel									
Ni-56	tetracarbonyl	0.1	$6.8.10^{-09}$	0.05	$5.2.10^{-09}$	$3.2.10^{-09}$	$2.1.10^{-09}$	$1.4.10^{-09}$	$1.2.10^{-09}$
Ni-57	tetracarbonyl	0.1	$3.1.10^{-09}$	0.05	$2.3.10^{-09}$	$1.4.10^{-09}$	$9.2.10^{-10}$	$6.5.10^{-10}$	$5.6.10^{-10}$
Ni-59	tetracarbonyl	0.1	$4.0.10^{-09}$	0.05	$3.3.10^{-09}$	$2.0.10^{-09}$	$1.3.10^{-09}$	$9.1.10^{-10}$	$8.3.10^{-10}$
Ni-63	tetracarbonyl	0.1	$9.5.10^{-09}$	0.05	$8.0.10^{-09}$	$4.8.10^{-09}$	$3.0.10^{-09}$	$2.2.10^{-09}$	$2.0.10^{-09}$
Ni-65	tetracarbonyl	0.1	$2.0.10^{-09}$	0.05	$1.4.10^{-09}$	$8.1.10^{-10}$	$5.6.10^{-10}$	$4.0.10^{-10}$	$3.6.10^{-10}$
Ni-66	tetracarbonyl	0.1	$1.0.10^{-08}$	0.05	$7.1.10^{-09}$	$4.0.10^{-09}$	$2.7.10^{-09}$	$1.8.10^{-09}$	$1.6.10^{-09}$
ruthenium									
Ru-94	RuO_4	0.1	$5.5.10^{-10}$	0.05	$3.5.10^{-10}$	$1.8.10^{-10}$	$1.1.10^{-10}$	$7.0.10^{-11}$	$5.6.10^{-11}$
Ru-97	RuO_4	0.1	$8.7.10^{-10}$	0.05	$6.2.10^{-10}$	$3.4.10^{-10}$	$2.2.10^{-10}$	$1.4.10^{-10}$	$1.2.10^{-10}$
Ru-103	RuO_4	0.1	$9.0.10^{-09}$	0.05	$6.2.10^{-09}$	$3.3.10^{-09}$	$2.1.10^{-09}$	$1.3.10^{-09}$	$1.1.10^{-09}$
Ru-105	RuO_4	0.1	$1.6.10^{-09}$	0.05	$1.0.10^{-09}$	$5.3.10^{-10}$	$3.2.10^{-10}$	$2.2.10^{-10}$	$1.8.10^{-10}$
Ru-106	RuO_4	0.1	$1.6.10^{-07}$	0.05	$1.1.10^{-07}$	$6.1.10^{-08}$	$3.7.10^{-08}$	$2.2.10^{-08}$	$1.8.10^{-08}$
tellurium									
Te-116	vapours	0.6	$5.9.10^{-10}$	0.3	$4.4.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$8.7.10^{-11}$

Element	**Substance**	f_1	h_{inh} **[Sv/Bq]**	f_1	h_{inh} **[Sv/Bq]**				
Nuclide		**Age < 1 year**		**≥ 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
Te-121	vapours	0.6	$3.0.10^{-09}$	0.3	$2.4.10^{-09}$	$1.4.10^{-09}$	$9.6.10^{-10}$	$6.7.10^{-10}$	$5.1.10^{-10}$
Te-121m	vapours	0.6	$3.5.10^{-08}$	0.3	$2.7.10^{-08}$	$1.6.10^{-08}$	$9.8.10^{-09}$	$6.6.10^{-09}$	$5.5.10^{-09}$
Te-123	vapours	0.6	$2.8.10^{-08}$	0.3	$2.5.10^{-08}$	$1.9.10^{-08}$	$1.5.10^{-08}$	$1.3.10^{-08}$	$1.2.10^{-08}$
Te-123m	vapours	0.6	$2.5.10^{-08}$	0.3	$1.8.10^{-08}$	$1.0.10^{-08}$	$5.7.10^{-09}$	$3.5.10^{-09}$	$2.9.10^{-09}$
Te-125m	vapours	0.6	$1.5.10^{-08}$	0.3	$1.1.10^{-08}$	$5.9.10^{-09}$	$3.2.10^{-09}$	$1.9.10^{-09}$	$1.5.10^{-09}$
Te-127	vapours	0.6	$6.1.10^{-10}$	0.3	$4.4.10^{-10}$	$2.3.10^{-10}$	$1.4.10^{-10}$	$9.2.10^{-11}$	$7.7.10^{-11}$
Te-127m	vapours	0.6	$5.3.10^{-08}$	0.3	$3.7.10^{-08}$	$1.9.10^{-08}$	$1.0.10^{-08}$	$6.1.10^{-09}$	$4.6.10^{-09}$
Te-129	vapours	0.6	$2.5.10^{-10}$	0.3	$1.7.10^{-10}$	$9.4.10^{-11}$	$6.2.10^{-11}$	$4.3.10^{-11}$	$3.7.10^{-11}$
Te-129m	vapours	0.6	$4.8.10^{-08}$	0.3	$3.2.10^{-08}$	$1.6.10^{-08}$	$8.5.10^{-09}$	$5.1.10^{-09}$	$3.7.10^{-09}$
Te-131	vapours	0.6	$5.1.10^{-10}$	0.3	$4.5.10^{-10}$	$2.6.10^{-10}$	$1.4.10^{-10}$	$9.5.10^{-11}$	$6.8.10^{-11}$
Te-131m	vapours	0.6	$2.1.10^{-08}$	0.3	$1.9.10^{-08}$	$1.1.10^{-08}$	$5.6.10^{-09}$	$3.7.10^{-09}$	$2.4.10^{-09}$
Te-132	vapours	0.6	$5.4.10^{-08}$	0.3	$4.5.10^{-08}$	$2.4.10^{-08}$	$1.2.10^{-08}$	$7.6.10^{-09}$	$5.1.10^{-09}$
Te-133	vapours	0.6	$5.5.10^{-10}$	0.3	$4.7.10^{-10}$	$2.5.10^{-10}$	$1.2.10^{-10}$	$8.1.10^{-11}$	$5.6.10^{-11}$
Te-133m	vapours	0.6	$2.3.10^{-09}$	0.3	$2.0.10^{-09}$	$1.1.10^{-09}$	$5.0.10^{-10}$	$3.3.10^{-10}$	$2.2.10^{-10}$
Te-134	vapours	0.6	$6.8.10^{-10}$	0.3	$5.5.10^{-10}$	$3.0.10^{-10}$	$1.6.10^{-10}$	$1.1.10^{-10}$	$8.4.10^{-11}$
iodine									
I-120	CH_3I	1.0	$2.3.10^{-09}$	1.0	$1.9.10^{-09}$	$1.0.10^{-09}$	$4.8.10^{-10}$	$3.1.10^{-10}$	$2.0.10^{-10}$
	I_2	1.0	$3.0.10^{-09}$	1.0	$2.4.10^{-09}$	$1.3.10^{-09}$	$6.4.10^{-10}$	$4.3.10^{-10}$	$3.0.10^{-10}$
I-120m	CH_3I	1.0	$1.0.10^{-09}$	1.0	$8.7.10^{-10}$	$4.6.10^{-10}$	$2.2.10^{-10}$	$1.5.10^{-10}$	$1.0.10^{-10}$
	I_2	1.0	$1.5.10^{-09}$	1.0	$1.2.10^{-09}$	$6.4.10^{-10}$	$3.4.10^{-10}$	$2.3.10^{-10}$	$1.8.10^{-10}$
I-121	CH_3I	1.0	$4.2.10^{-10}$	1.0	$3.8.10^{-10}$	$2.2.10^{-10}$	$1.2.10^{-10}$	$8.3.10^{-11}$	$5.6.10^{-11}$
	I_2	1.0	$5.7.10^{-10}$	1.0	$5.1.10^{-10}$	$3.0.10^{-10}$	$1.7.10^{-10}$	$1.2.10^{-10}$	$8.6.10^{-11}$
I-123	CH_3I	1.0	$1.6.10^{-09}$	1.0	$1.4.10^{-09}$	$7.7.10^{-10}$	$3.6.10^{-10}$	$2.4.10^{-10}$	$1.5.10^{-10}$
	I_2	1.0	$2.1.10^{-09}$	1.0	$1.8.10^{-09}$	$1.0.10^{-09}$	$4.7.10^{-10}$	$3.2.10^{-10}$	$2.1.10^{-10}$
I-124	CH_3I	1.0	$8.5.10^{-08}$	1.0	$8.0.10^{-08}$	$4.5.10^{-08}$	$2.2.10^{-08}$	$1.4.10^{-08}$	$9.2.10^{-09}$
	I_2	1.0	$1.1.10^{-07}$	1.0	$1.0.10^{-07}$	$5.8.10^{-08}$	$2.8.10^{-08}$	$1.8.10^{-08}$	$1.2.10^{-08}$
I-125	CH_3I	1.0	$3.7.10^{-08}$	1.0	$4.0.10^{-08}$	$2.9.10^{-08}$	$2.2.10^{-08}$	$1.6.10^{-08}$	$1.1.10^{-08}$
	I_2	1.0	$4.7.10^{-08}$	1.0	$5.2.10^{-08}$	$3.7.10^{-08}$	$2.8.10^{-08}$	$2.0.10^{-08}$	$1.4.10^{-08}$
I-126	CH_3I	1.0	$1.5.10^{-07}$	1.0	$1.5.10^{-07}$	$9.0.10^{-08}$	$4.8.10^{-08}$	$3.2.10^{-08}$	$2.0.10^{-08}$
	I_2	1.0	$1.9.10^{-07}$	1.0	$1.9.10^{-07}$	$1.1.10^{-07}$	$6.2.10^{-08}$	$4.1.10^{-08}$	$2.6.10^{-08}$
I-128	CH_3I	1.0	$1.5.10^{-10}$	1.0	$1.2.10^{-10}$	$6.3.10^{-11}$	$3.0.10^{-11}$	$1.9.10^{-11}$	$1.3.10^{-11}$
	I_2	1.0	$4.2.10^{-10}$	1.0	$2.8.10^{-10}$	$1.6.10^{-10}$	$1.0.10^{-10}$	$7.5.10^{-11}$	$6.5.10^{-11}$
I-129	CH_3I	1.0	$1.3.10^{-07}$	1.0	$1.5.10^{-07}$	$1.2.10^{-07}$	$1.3.10^{-07}$	$9.9.10^{-08}$	$7.4.10^{-08}$
	I_2	1.0	$1.7.10^{-07}$	1.0	$2.0.10^{-07}$	$1.6.10^{-07}$	$1.7.10^{-07}$	$1.3.10^{-07}$	$9.6.10^{-08}$
I-130	CH_3I	1.0	$1.5.10^{-08}$	1.0	$1.3.10^{-08}$	$7.2.10^{-09}$	$3.3.10^{-09}$	$2.2.10^{-09}$	$1.4.10^{-09}$

Element	**Substance**	**f_1**	**h_{inh} [Sv/Bq]**	**f_1**	**h_{inh} [Sv/Bq]**				
Nuclide		**Age < 1 year**		**≥ 1 year**	**1 year**	**5 years**	**10 years**	**15 years**	**adult**
	I_2	1.0	$1.9.10^{-08}$	1.0	$1.7.10^{-08}$	$9.2.10^{-09}$	$4.3.10^{-09}$	$2.8.10^{-09}$	$1.9.10^{-09}$
I-131	CH_3I	1.0	$1.3.10^{-07}$	1.0	$1.3.10^{-07}$	$7.4.10^{-08}$	$3.7.10^{-08}$	$2.4.10^{-08}$	$1.5.10^{-08}$
	I_2	1.0	$1.7.10^{-07}$	1.0	$1.6.10^{-07}$	$9.4.10^{-08}$	$4.8.10^{-08}$	$3.1.10^{-08}$	$2.0.10^{-08}$
I-132	CH_3I	1.0	$2.0.10^{-09}$	1.0	$1.8.10^{-09}$	$9.5.10^{-10}$	$4.4.10^{-10}$	$2.9.10^{-10}$	$1.9.10^{-10}$
	I_2	1.0	$2.8.10^{-09}$	1.0	$2.3.10^{-09}$	$1.3.10^{-09}$	$6.4.10^{-10}$	$4.3.10^{-10}$	$3.1.10^{-10}$
I-132m	CH_3I	1.0	$1.8.10^{-09}$	1.0	$1.6.10^{-09}$	$8.3.10^{-10}$	$3.9.10^{-10}$	$2.5.10^{-10}$	$1.6.10^{-10}$
	I_2	1.0	$2.4.10^{-09}$	1.0	$2.1.10^{-09}$	$1.1.10^{-09}$	$5.6.10^{-10}$	$3.8.10^{-10}$	$2.7.10^{-10}$
I-133	CH_3I	1.0	$3.5.10^{-08}$	1.0	$3.2.10^{-08}$	$1.7.10^{-08}$	$7.6.10^{-09}$	$4.9.10^{-09}$	$3.1.10^{-09}$
	I_2	1.0	$4.5.10^{-08}$	1.0	$4.1.10^{-08}$	$2.1.10^{-08}$	$9.7.10^{-09}$	$6.3.10^{-09}$	$4.0.10^{-09}$
I-134	CH_3I	1.0	$5.1.10^{-10}$	1.0	$4.3.10^{-10}$	$2.3.10^{-10}$	$1.1.10^{-10}$	$7.4.10^{-11}$	$5.0.10^{-11}$
	I_2	1.0	$8.7.10^{-10}$	1.0	$6.9.10^{-10}$	$3.9.10^{-10}$	$2.2.10^{-10}$	$1.6.10^{-10}$	$1.5.10^{-10}$
I-135	CH_3I	1.0	$7.5.10^{-09}$	1.0	$6.7.10^{-09}$	$3.5.10^{-09}$	$1.6.10^{-09}$	$1.1.10^{-09}$	$6.8.10^{-10}$
	I_2	1.0	$9.7.10^{-09}$	1.0	$8.5.10^{-09}$	$4.5.10^{-09}$	$2.1.10^{-09}$	$1.4.10^{-09}$	$9.2.10^{-10}$
mercury									
Hg-193	vapours	1.0	$4.2.10^{-09}$	1.0	$3.4.10^{-09}$	$2.2.10^{-09}$	$1.6.10^{-09}$	$1.2.10^{-09}$	$1.1.10^{-09}$
Hg-193m	vapours	1.0	$1.2.10^{-08}$	1.0	$9.4.10^{-09}$	$6.1.10^{-09}$	$4.5.10^{-09}$	$3.4.10^{-09}$	$3.1.10^{-09}$
Hg-194	vapours	1.0	$9.4.10^{-08}$	1.0	$8.3.10^{-08}$	$6.2.10^{-08}$	$5.0.10^{-08}$	$4.3.10^{-08}$	$4.0.10^{-08}$
Hg-195	vapours	1.0	$5.3.10^{-09}$	1.0	$4.3.10^{-09}$	$2.8.10^{-09}$	$2.1.10^{-09}$	$1.6.10^{-09}$	$1.4.10^{-09}$
Hg-195m	vapours	1.0	$3.0.10^{-08}$	1.0	$2.5.10^{-08}$	$1.6.10^{-08}$	$1.2.10^{-08}$	$8.8.10^{-09}$	$8.2.10^{-09}$
Hg-197	vapours	1.0	$1.6.10^{-08}$	1.0	$1.3.10^{-08}$	$8.4.10^{-09}$	$6.3.10^{-09}$	$4.7.10^{-09}$	$4.4.10^{-09}$
Hg-197m	vapours	1.0	$2.1.10^{-08}$	1.0	$1.7.10^{-08}$	$1.1.10^{-08}$	$8.2.10^{-09}$	$6.2.10^{-09}$	$5.8.10^{-09}$
Hg-199m	vapours	1.0	$6.5.10^{-10}$	1.0	$5.3.10^{-10}$	$3.4.10^{-10}$	$2.5.10^{-10}$	$1.9.10^{-10}$	$1.8.10^{-10}$
Hg-203	vapours	1.0	$3.0.10^{-08}$	1.0	$2.3.10^{-08}$	$1.5.10^{-08}$	$1.0.10^{-08}$	$7.7.10^{-09}$	$7.0.10^{-09}$

Legend:

Conversion factors h_{inh} listed in the table are used to convert intake of radionuclides to the committed effective dose for inhalation of radioactive fumes.
Conversion factors for a radiation worker and the adult members of the population are the same.An exception is the value for sulphur S-35 in the form SO_2, for a radiation worker $h_{inh} = 1.2 \times 10^{-10}$ Sv/Bq.

Annex No 4 to Decree No. 422/2016 Coll.

Representative characteristics considered when selecting optimal radiation protection alternatives

When selecting the optimal variant in the optimisation process, the following aspects and details must be taken into account:

1. The level of the exposure of persons for the purposes of comparing options to reduce planned or already received doses to individuals or groups of the population that is expressed or characterised by
   1.1. Breaking down the exposure of all persons in time and space depending on the type of source of ionising radiation, both in the workplace and in its vicinity, taking into account the results of real-world measurements, if available, or estimates based on calculation models.
   1.2. The results of the measurement of personal doses, if they are available for the given exposure situation, which includes the average individual dose, the lowest and highest personal dose, number of irradiated individuals, the collective total dose and the distribution of individual doses, i.e. the distribution of individual doses at stipulated individual dose intervals.
   1.3. The probability of potential exposure, which is an estimate of the possible frequency of occurrence of different levels of potential exposures in case of an emergency exposure situation.
   1.4. Initial radiological conditions during the optimisation process, which especially include the degree of exposure to natural background radiation or increased exposure levels due to previous activities and accidents.
2. Dose optimisation limits or reference levels for a given activity, if they are stipulated, which serve as the upper limit for the exposure of individuals that are exposed to radiation in the given situation, where out of the possible variants of the radiation protection preference should be given to those that ensure that the stipulated dose optimisation limits or reference levels are not exceeded during the given activity.
3. Examples of best practice
   3.1. Examples of best practice must be taken into account, if they are available for the given activity.
   3.2. For similar activities with a source of ionising radiation, procedures or methods for ensuring radiation protection established as best practice must be taken into account.
4. Technical, organisational, and economic aspects
   4.1. When choosing the best economic provision of radiation protection in the relevant situation, one can use procedures that weigh the benefits of the implemented radiation protection measure, usually expressed as the avoided collective dose in the form of its financial equivalent, against the financial costs of this measure.
   4.2. Consideration of a solution according to the principle of best available technology, which means the assessment of the existence and availability of the best and most effective technologies in the considered area and the possibility of their use, taking account of the costs of their deployment or acquisition, which may be high, but may increase radiation protection significantly.

Annex 5 to Decree No. 422/2016 Coll.

Procedures for performing conservative estimates of irradiation of a representative individual

1. Determination of a representative individual and assessment of their exposure must be carried out based on information on the source of ionising radiation, including
   1.1. expected radionuclides released during the calendar year into the environment from the workplace and their activities, and
   1.2. dose rates as a result of radiation emitted into the vicinity of the workplace.
2. The content of radionuclides in components of the environment must be determined by
   2.1. direct measurement, or
   2.2. use of a suitable model for radionuclide propagation in the vicinity of the workplace subject to ionising radiation, taking into account long-term knowledge of parameters characterising the meteorological or hydrological situation in the vicinity of the workplace with the source of ionising radiation.
3. It is necessary to take into account the possible accumulation of radionuclides with a long half-life in the environment during the expected period of operation of a workplace with a source of ionising radiation.
4. Data regarding the living habits of the population in residential areas where the highest content of radionuclides is measured or calculated in components of the environment (hereinafter the ‘selected group of people’) must be investigated to the extent of information about the location, eating habits and lifestyle, while taking into account physiological factors, especially age. Data on individuals with extreme habits must be excluded from data on the living habits of the selected group of people. The data on the living habits of the selected group of people must be applicable over the long term. If it is impossible obtain data on the living habits of the local population, information from the appropriate regional or national statistics must be used, and for the amount of air inhaled and water ingested, data pursuant to § 67(2) and (3).
5. Based on data on the content of radionuclides in components of the environment and on the living habits of the selected group of people, it is necessary to stipulate the annual intake of individual radionuclides via all expected avenues of irradiation for individuals from the selected group of people.
6. To convert the activities of radionuclides taken in to the annual committed effective dose, conversion factors pursuant to Annex 3 to this Decree must be used for the selected group of people. The conversion must be performed for the age range:
   6.1. 0 to 5 years by using the conversion factor for an age of 1 year;
   6.2. 6 to 15 years by using the conversion factor for age 10;
   6.3. 16 to 70 years by using the conversion factor for an adult.
7. For the selected group of people, the effective dose from external exposure due to exposure to radionuclides in components of the environment or irradiation that penetrates the shielding of a source of ionising radiation and is dispersed in its vicinity. The total effective dose per calendar year for individuals from the selected group of people is the sum of the annual committed effective dose from the intake of radionuclides and the effective dose from external radiation.
8. The individual with the highest effective dose for the calendar year from the selected group of people specified pursuant to points 1 to 7 is the representative person. When comparing the annual doses of an authorised representative person with the authorised limit, it is necessary to use the activities of radionuclides released in the relevant calendar year into the environment from the workplace containing a source of ionising radiation or

as dose rates due to radiation dispersing into the vicinity of the workplace. If the annual doses of the representative person are determined using a radionuclide dispersal model, the data on the meteorological or hydrological situation in the relevant calendar year must be used.

Annex 6 to Decree No. 422/2016 Coll.

The contents of an optimisation study for stipulating the authorised exposure limit for a representative person

An optimisation study for stipulating the authorised exposure limit for a representative person must:

1. stipulate the representative person and estimate his or her exposure using the procedure pursuant to Annex 5 to this Decree;
2. list circumstances affecting exposure of the representative person that are related to the amount of radioactive substances and ionising radiation released into the environment and conditions of their dispersal in the vicinity of a workplace containing a source of ionising radiation;
3. include a document certifying that radionuclides released during the calendar year into the environment from the workplace containing a source of ionising radiation dispersing into the vicinity of the workplace correspond to the planned exposure situation resulting from the expected operation of this workplace; this document must take into account available technical and organisational measures to reduce the amount of radioactive substances or ionising radiation released into the environment;
4. contain the expected profile of radionuclide release into the environment during the calendar year, including consideration of the possibility of releasing the entire activity of some radionuclide during a short period of time all at once; and
5. contain a justified choice of conditions for radionuclide dispersal in the atmosphere or hydrosphere that will be used to stipulate the proposed values of the authorised limit taking into the expected radionuclide release profile pursuant to point 4.

Legend:

In choosing parameters pursuant to points 3 to 5, an approach must be used that is

1. deterministic, which must use a justified conservative approach to select the set of parameters leading to the highest authorised limit value, or
2. probabilistic, wherein
    a. the scope of parameters must be taken into account, and
    b. the resulting probability that the representative person will be exposed to a degree exceeding the proposed authorised limit is at most 5 %.

Annex 7 to Decree No. 422/2016 Coll.

Exemption and clearance levels

Specific activity exemption levels and clearance levels for any amount and any type of solid radioactive substance

Nuclide	Specific activity [kBq/kg]	Nuclide	Specific activity [kBq/kg]	Nuclide	Specific activity [kBq/kg]
H-3	100	Co-55	10	Sr-92	10
Be-7	10	Co-56	0.1	Y-90	1000
C-14	1	Co-57	1	Y-91	100
F-18	10	Co-58	1	Y-91m	100
Na-22	0.1	Co-58m	10000	Y-92	100
Na-24	1	Co-60	0.1	Y-93	100
Si-31	1000	Co-60m	1000	Zr-93	10
P-32	1000	Co-61	100	Zr-95*	1
P-33	1000	Co-62m	10	Zr-97*	10
S-35	100	Ni-59	100	Nb-93m	10
Cl-36	1	Ni-63	100	Nb-94	0.1
Cl-38	10	Ni-65	10	Nb-95	1
K-42	100	Cu-64	100	Nb-97*	10
K-43	10	Zn-65	0.1	Nb-98	10
K-40	10	Zn-69	1000	Mo-90	10
Ca-45	100	Zn-69m*	10	Mo-93	10
Ca-47	10	Ga-72	10	Mo-99*	10
Sc-46	0.1	Ge-71	10000	Mo-101*	10
Sc-47	100	As-73	1000	Tc-96	1
Sc-48	1	As-74	10	Tc-96m	1000
V-48	1	As-76	10	Tc-97	10
Cr-51	100	As-77	1000	Tc-97m	100
Mn-51	10	Se-75	1	Tc-99	1
Mn-52	1	Br-82	1	Tc-99m	100
Mn-52m	10	Rb-86	100	Ru-97	10
Mn-53	100	Sr-85	1	Ru-103*	1
Mn-54	0.1	Sr-85m	100	Ru-105*	10
Mn-56	10	Sr-87m	100	Ru-106*	0.1
Fe-52*	10	Sr-89	1000	Rh-103m	10000
Fe-55	1000	Sr-90*	1	Rh-105	100
Fe-59	1	Sr-91*	10	Pd-103*	1000

Nuclide	Specific activity [kBq/kg]
Pd-109*	100
Ag-105	1
Ag-110m*	0.1
Ag-111	100
Cd-109*	1
Cd-115*	10
Cd-115m*	100
In-111	10
In-113m	100
In-114m*	10
In-115m	100
Sn-113*	1
Sn-125	10
Sb-122	10
Sb-124	1
Sb-125*	0.1
Te-123m	1
Te-125m	1000
Te-127	1000
Te-127m*	10
Te-129	100
Te-129m*	10
Te-131	100
Te-131m*	10
Te-132*	1
Te-133	10
Te-133m	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

Nuclide	Specific activity [kBq/kg]
I-134	10
I-135	10
Cs-129	10
Cs-131	1000
Cs-132	10
Cs-134	0.1
Cs-134m	1000
Cs-135	100
Cs-136	1
Cs-137*	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	1000
Nd-147	100
Nd-149	100
Pm-147	1000
Pm-149	1000
Sm-151	1000
Sm-153	100
Eu-152	0.1
Eu-152m	100
Eu-154	0.1
Eu-155	1
Gd-153	10
Gd-159	100
Tb-160	1
Dy-165	1000
Dy-166	100
Ho-166	100

Nuclide	Specific activity [kBq/kg]
Er-169	1000
Er-171	100
Tm-170	100
Tm-171	1000
Yb-175	100
Lu-177	100
Hf-181	1
Ta-182	0.1
W-181	10
W-185	1000
W-187	10
Re-186	1000
Re-188	100
Os-185	1
Os-191	100
Os-191m	1000
Os-193	100
Ir-190	1
Ir-192	1
Ir-194	100
Pt-191	10
Pt-193m	1000
Pt-197	1000
Pt-197m	100
Au-198	10
Au-199	100
Hg-197	100
Hg-197m	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

Nuclide	Specific activity [kBq/kg]
Po-203	10
Po-205	10
Po-207	10
At-211	1000
Ra-225	10
Ra-227	100
Th-226	1000
Th-229	0.1
Th-232	1
Pa-230	10
Pa-233	10
U-230	10
U-231	100
U-232*	0.1
U-233	1
U-236	10
U-237	100
U-238	1
U-239	100
U-240*	100
Np-237*	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	1000
Pu-244*	0.1
Am-241	0.1
Am-242	1000

Nuclide	Specific activity [kBq/kg]
Am-242m*	0.1
Am-243*	0.1
Cm-242	10
Cm-243	1
Cm-244	1
Cm-245	0.1
Cm-246	0.1
Cm-247*	0.1
Cm-248	0.1
Bk-249	100
Cf-246	1000
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*	0.1
Es-254m*	10
Fm-254	10000
Fm-255	100

Legend:

Specific activity values for nuclides marked with * (parent nuclides) also include their decay products (progeny) with which they are in radioactive equilibrium.
Progeny that are in radioactive equilibrium with their parent nuclide are not assessed independently.

Parent nuclides and corresponding progeny in radioactive equilibrium

Parent nuclide	Progeny
Fe-52	Mn-52m
Zn-69m	Zn-69
Sr-90	Y-90
Sr-91	Y-91m
Zr-95	Nb-95
Zr-97	Nb-97m, Nb-97
Mo-99*	Tc-99m
Nb-97	Nb-97m
Mo-99	Tc-99m
Mo-101	Tc-101
Ru-103	Rh-103m
Ru-105	Rh-105m
Ru-106	Rh-106
Pd-103	Rh-103m
Pd-109	Ag-109m
Ag-110m	Ag-110
Cd-109	Ag-109m
Cd-115	In-115m
Cd-115m	In-115m
In-114m	In-114
Sn-113	In-113m
Sb-125	Te-125m
Te-127m	Te-127
Te-129m	Te-129
Te-131m	Te-131
Te132	I-132
Cs-137	Ba-137m
Ce-144	Pr-144, Pr-144m
U-232	Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208
U-240	Np-240m, Np-240
Np-237	Pa-233
Pu-244	U-240, Np-240m, Np-240
Am-242m	Np-238
Am-243	Np-239
Cm-247	Pu-243
Es-254	Bk-250

Parent nuclide	Progeny
Es-254m	Fm-254

Specific activity exemption levels for a moderate amount of radioactive substance and activity exemption levels

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
H-3	10^6	10^9
Be-7	10^3	10^7
Be-10	10^4	10^6
C-11	10	10^6
C-14	10^4	10^7
N-13	10^2	10^9
Ne-19	10^2	10^9
O-15	10^2	10^9
F-18	10	10^6
Na-22	10	10^6
Na-24	10	10^5
Mg-28	10	10^5
Al-26	10	10^5
Si-31	10^3	10^6
Si-32	10^3	10^6
P-32	10^3	10^5
P-33	10^5	10^8
S-35	10^5	10^8
Cl-36	10^4	10^6
Cl-38	10	10^5
Cl-39	10	10^5
Ar-37	10^6	10^8
Ar-39	10^7	10^4
Ar-41	10^2	10^9
K-40	10^2	10^6
K-42	10^2	10^6
K-43	10	10^6
K-44	10	10^5
K-45	10	10^5
Ca-41	10^5	10^7
Ca-45	10^4	10^7
Ca-47	10	10^6
Sc-43	10	10^6
Sc-44	10	10^5

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Sc-45	10^2	10^7
Sc-46	10	10^6
Sc-47	10^2	10^6
Sc-48	10	10^5
Sc-49	10^3	10^5
Ti-44	10	10^5
Ti-45	10	10^6
V-47	10	10^5
V-48	10	10^5
V-49	10^4	10^7
Cr-48	10^2	10^6
Cr-49	10	10^6
Cr-51	10^3	10^7
Mn-51	10	10^5
Mn-52	10	10^5
Mn-52m	10	10^5
Mn-53	10^4	10^9
Mn-54	10	10^6
Mn-56	10	10^5
Fe-52	10	10^6
Fe-55	10^4	10^6
Fe-59	10	10^6
Fe-60	10^2	10^5
Co-55	10	10^6
Co-56	10	10^5
Co-57	10^2	10^6
Co-58	10	10^6
Co-58m	10^4	10^7
Co-60	10	10^5
Co-60m	10^3	10^6
Co-61	10^2	10^6
Co-62m	10	10^5
Ni-56	10	10^6
Ni-57	10	10^6

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Ni-59	10^4	10^8
Ni-63	10^5	10^8
Ni-65	10	10^6
Ni-66	10^4	10^7
Cu-60	10	10^5
Cu-61	10	10^6
Cu-64	10^2	10^6
Cu-67	10^2	10^6
Zn-62	10^2	10^6
Zn-63	10	10^5
Zn-65	10	10^6
Zn-69	10^4	10^6
Zn-69m	10^2	10^6
Zn-71m	10	10^6
Zn-72	10^2	10^6
Ga-65	10	10^5
Ga-66	10	10^5
Ga-67	10^2	10^6
Ga-68	10	10^5
Ga-70	10^2	10^6
Ga-72	10	10^5
Ga-73	10^2	10^6
Ge-66	10	10^6
Ge-67	10	10^5
Ge-68*	10	10^5
Ge-69	10	10^6
Ge-71	10^4	10^8
Ge-75	10^3	10^6
Ge-77	10	10^5
Ge-78	10^2	10^6
As-69	10	10^5
As-70	10	10^5
As-71	10	10^6
As-72	10	10^5
As-73	10^3	10^7
As-74	10	10^6

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
As-76	10^2	10^5
As-77	10^3	10^6
As-78	10	10^5
Se-70	10	10^6
Se-73	10	10^6
Se-73m	10^2	10^6
Se-75	10^2	10^6
Se-79	10^4	10^7
Se-81	10^3	10^6
Se-81m	10^3	10^7
Se-83	10	10^5
Br-74	10	10^5
Br-74m	10	10^5
Br-75	10	10^6
Br-76	10	10^5
Br-77	10^2	10^6
Br-80	10^2	10^5
Br-80m	10^3	10^7
Br-82	10	10^6
Br-83	10^3	10^6
Br-84	10	10^5
Kr-74	10^2	10^9
Kr-76	10^2	10^9
Kr-77	10^2	10^9
Kr-79	10^3	10^5
Kr-81	10^4	10^7
Kr-81m	10^3	10^{10}
Kr-83m	10^5	10^{12}
Kr-85	10^5	10^4
Kr-85m	10^3	10^{10}
Kr-87	10^2	10^9
Kr-88	10^2	10^9
Rb-79	10	10^5
Rb-81	10	10^6
Rb-81m	10^3	10^7
Rb-82m	10	10^6

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Rb-83*	10^2	10^6
Rb-84	10	10^6
Rb-86	10^2	10^5
Rb-87	10^3	10^7
Rb-88	10^2	10^5
Rb-89	10^2	10^5
Sr-80	10^3	10^7
Sr-81	10	10^5
Sr-82*	10	10^5
Sr-83	10	10^6
Sr-85	10^2	10^6
Sr-85m	10^2	10^7
Sr-87m	10^2	10^6
Sr-89	10^3	10^6
Sr-90*	10^2	10^4
Sr-91	10	10^5
Sr-92	10	10^6
Y-86	10	10^5
Y-86m	10^2	10^7
Y-87*	10	10^6
Y-88	10	10^6
Y-90	10^3	10^5
Y-90m	10	10^6
Y-91	10^3	10^6
Y-91m	10^2	10^6
Y-92	10^2	10^5
Y-93	10^2	10^5
Y-94	10	10^5
Y-95	10	10^5
Zr-86	10^2	10^7
Zr-88	10^2	10^6
Zr-89	10	10^6
Zr-93*	10^3	10^7
Zr-95	10	10^6
Zr-97*	10	10^5
Nb-88	10	10^5

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Nb-89	10	10^5
Nb-89m	10	10^5
Nb-90	10	10^5
Nb-93m	10^4	10^7
Nb-94	10	10^6
Nb-95	10	10^6
Nb-95m	10^2	10^7
Nb-96	10	10^5
Nb-97	10	10^6
Nb-98	10	10^5
Mo-90	10	10^6
Mo-93	10^3	10^8
Mo-93m	10	10^6
Mo-99*	10^2	10^6
Mo-101	10	10^6
Tc-93	10	10^6
Tc-93m	10	10^6
Tc-94	10	10^6
Tc-94m	10	10^5
Tc-95	10	10^6
Tc-95m	10	10^6
Tc-96	10	10^6
Tc-96m	10^3	10^7
Tc-97	10^3	10^8
Tc-97m	10^3	10^7
Tc-98	10	10^6
Tc-99	10^4	10^7
Tc-99m	10^2	10^7
Tc-101	10^2	10^6
Tc-104	10	10^5
Ru-94	10^2	10^6
Ru-97	10^2	10^7
Ru-103	10^2	10^6
Ru-105	10	10^6
Ru-106*	10^2	10^5
Rh-99	10	10^6

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Rh-99m	10	10^6
Rh-100	10	10^6
Rh-101	10^2	10^7
Rh-101m	10^2	10^7
Rh-102	10	10^6
Rh-102m	10^2	10^6
Rh-103m	10^4	10^8
Rh-105	10^2	10^7
Rh-106m	10	10^5
Rh-107	10^2	10^6
Pd-100	10^2	10^7
Pd-101	10^2	10^6
Pd-103	10^3	10^8
Pd-107	10^5	10^8
Pd-109	10^3	10^6
Ag-102	10	10^5
Ag-103	10	10^6
Ag-104	10	10^6
Ag-104m	10	10^6
Ag-105	10^2	10^6
Ag-106	10	10^6
Ag-106m	10	10^6
Ag-108m*	10	10^6
Ag-110m	10	10^6
Ag-111	10^3	10^6
Ag-112	10	10^5
Ag-115	10	10^5
Cd-104	10^2	10^7
Cd-107	10^3	10^7
Cd-109	10^4	10^6
Cd-113	10^3	10^6
Cd-113m	10^3	10^6
Cd-115	10^2	10^6
Cd-115m	10^3	10^6
Cd-117	10	10^6
Cd-117m	10	10^6

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
In-109	10	10^6
In-110	10	10^6
In-110m	10	10^5
In-111	10^2	10^6
In-112	10^2	10^6
In-113m	10^2	10^6
In-114	10^3	10^5
In-114m	10^2	10^6
In-115	10^3	10^5
In-115m	10^2	10^6
In-116m	10	10^5
In-117	10	10^6
In-117m	10^2	10^6
In-119m	10^2	10^5
Sn-110	10^2	10^7
Sn-111	10^2	10^6
Sn-113	10^3	10^7
Sn-117m	10^2	10^6
Sn-119m	10^3	10^7
Sn-121	10^5	10^7
Sn-121m*	10^3	10^7
Sn-123	10^3	10^6
Sn-123m	10^2	10^6
Sn-125	10^2	10^5
Sn-126*	10	10^5
Sn-127	10	10^6
Sn-128	10	10^6
Sb-115	10	10^6
Sb-116	10	10^6
Sb-116m	10	10^5
Sb-117	10^2	10^7
Sb-118m	10	10^6
Sb-119	10^3	10^7
Sb-120	10^2	10^6
Sb-120m	10	10^6
Sb-122	10^2	10^4

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Sb-124	10	10^6
Sb-124m	10^2	10^6
Sb-125	10^2	10^6
Sb-126	10	10^5
Sb-126m	10	10^5
Sb-127	10	10^6
Sb-128	10	10^5
Sb-128m	10	10^5
Sb-129	10	10^6
Sb-130	10	10^5
Sb-131	10	10^6
Te-116	10^2	10^7
Te-121	10	10^6
Te-121m	10^2	10^6
Te-123	10^3	10^6
Te-123m	10^2	10^7
Te-125m	10^3	10^7
Te-127	10^3	10^6
Te-127m	10^3	10^7
Te-129	10^2	10^6
Te-129m	10^3	10^6
Te-131	10^2	10^5
Te-131m	10	10^6
Te-132	10^2	10^7
Te-133	10	10^5
Te-133m	10	10^5
Te-134	10	10^6
I-120	10	10^5
I-120m	10	10^5
I-121	10^2	10^6
I-123	10^2	10^7
I-124	10	10^6
I-125	10^3	10^6
I-126	10^2	10^6
I-128	10^2	10^5
I-129	10^2	10^5

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
I-130	10	10^6
I-131	10^2	10^6
I-132	10	10^5
I-132m	10^2	10^6
I-133	10	10^6
I-134	10	10^5
I-135	10	10^6
Xe-120	10^2	10^9
Xe-121	10^2	10^9
Xe-122*	10^2	10^9
Xe-123	10^2	10^9
Xe-125	10^3	10^9
Xe-127	10^3	10^5
Xe-129m	10^3	10^4
Xe-131m	10^4	10^4
Xe-133m	10^3	10^4
Xe-133	10^3	10^4
Xe-135	10^3	10^{10}
Xe-135m	10^2	10^9
Xe-138	10^2	10^9
Cs-125	10	10^4
Cs-127	10^2	10^5
Cs-129	10^2	10^5
Cs-130	10^2	10^6
Cs-131	10^3	10^6
Cs-132	10	10^5
Cs-134m	10^3	10^5
Cs-134	10	10^4
Cs-135	10^4	10^7
Cs-135m	10	10^6
Cs-136	10	10^5
Cs-137*	10	10^4
Cs-138	10	10^4
Ba-126	10^2	10^7
Ba-128	10^2	10^7
Ba-131	10^2	10^6

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Ba-131m	10^2	10^7
Ba-133	10^2	10^6
Ba-133m	10^2	10^6
Ba-135m	10^2	10^6
Ba-137m	10	10^6
Ba-139	10^2	10^5
Ba-140*	10	10^5
Ba-141	10^2	10^5
Ba-142	10^2	10^6
La-131	10	10^6
La-132	10	10^6
La-135	10^3	10^7
La-137	10^3	10^7
La-138	10	10^6
La-140	10	10^5
La-141	10^2	10^5
La-142	10	10^5
La-143	10^2	10^5
Ce-134*	10^3	10^7
Ce-135	10	10^6
Ce-137	10^3	10^7
Ce-137m	10^3	10^6
Ce-139	10^2	10^6
Ce-141	10^2	10^7
Ce-143	10^2	10^6
Ce-144*	10^2	10^5
Pr-136	10	10^5
Pr-137	10^2	10^6
Pr-138m	10	10^6
Pr-139	10^2	10^7
Pr-142	10^2	10^5
Pr-142m	10^7	10^9
Pr-143	10^4	10^6
Pr-144	10^2	10^5
Pr-145	10^3	10^5
Pr-147	10	10^5

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Nd-136	10^2	10^6
Nd-138	10^3	10^7
Nd-139	10^2	10^6
Nd-139m	10	10^6
Nd-141	10^2	10^7
Nd-147	10^2	10^6
Nd-149	10^2	10^6
Nd-151	10	10^5
Pm-141	10	10^5
Pm-143	10^2	10^6
Pm-144	10	10^6
Pm-145	10^3	10^7
Pm-146	10	10^6
Pm-147	10^4	10^7
Pm-148	10	10^5
Pm-148m	10	10^6
Pm-149	10^3	10^6
Pm-150	10	10^5
Pm-151	10^2	10^6
Sm-141	10	10^5
Sm-141m	10	10^6
Sm-142	10^2	10^7
Sm-145	10^2	10^7
Sm-146	10	10^5
Sm-147	10	10^4
Sm-151	10^4	10^8
Sm-153	10^2	10^6
Sm-155	10^2	10^6
Sm-156	10^2	10^6
Eu-145	10	10^6
Eu-146	10	10^6
Eu-147	10^2	10^6
Eu-148	10	10^6
Eu-149	10^2	10^7
Eu-150	10	10^6
Eu-150m	10^3	10^6

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Eu-152	10	10^6
Eu-152m	10^2	10^6
Eu-154	10	10^6
Eu-155	10^2	10^7
Eu-156	10	10^6
Eu-157	10^2	10^6
Eu-158	10	10^5
Gd-145	10	10^5
Gd-146*	10	10^6
Gd-147	10	10^6
Gd-148	10	10^4
Gd-149	10^2	10^6
Gd-151	10^2	10^7
Gd-152	10	10^4
Gd-153	10^2	10^7
Gd-159	10^3	10^6
Tb-147	10	10^6
Tb-149	10	10^6
Tb-150	10	10^6
Tb-151	10	10^6
Tb-153	10^2	10^7
Tb-154	10	10^6
Tb-155	10^2	10^7
Tb-156	10	10^6
Tb-156m (24,4 h)	10^3	10^7
Tb-156m' (5 h)	10^4	10^7
Tb-157	10^4	10^7
Tb-158	10	10^6
Tb-160	10	10^6
Tb-161	10^3	10^6
Dy-155	10	10^6
Dy-157	10^2	10^6
Dy-159	10^3	10^7
Dy-165	10^3	10^6
Dy-166	10^3	10^6
Ho-155	10^2	10^6

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Ho-157	10^2	10^6
Ho-159	10^2	10^6
Ho-161	10^2	10^7
Ho-162	10^2	10^7
Ho-162m	10	10^6
Ho-164	10^3	10^6
Ho-164m	10^3	10^7
Ho-166	10^3	10^5
Ho-166m	10	10^6
Ho-167	10^2	10^6
Er-161	10	10^6
Er-165	10^3	10^7
Er-169	10^4	10^7
Er-171	10^2	10^6
Er-172	10^2	10^6
Tm-162	10	10^6
Tm-166	10	10^6
Tm-167	10^2	10^6
Tm-170	10^3	10^6
Tm-171	10^4	10^8
Tm-172	10^2	10^6
Tm-173	10^2	10^6
Tm-175	10	10^6
Yb-162	10^2	10^7
Yb-166	10^2	10^7
Yb-167	10^2	10^6
Yb-169	10^2	10^7
Yb-175	10^3	10^7
Yb-177	10^2	10^6
Yb-178	10^3	10^6
Lu-169	10	10^6
Lu-170	10	10^6
Lu-171	10	10^6
Lu-172	10	10^6
Lu-173	10^2	10^7
Lu-174	10^2	10^7

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Lu-174m	10^2	10^7
Lu-176	10^2	10^6
Lu-176m	10^3	10^6
Lu-177	10^3	10^7
Lu-177m	10	10^6
Lu-178	10^2	10^5
Lu-178m	10	10^5
Lu-179	10^3	10^6
Hf-170	10^2	10^6
Hf-172*	10	10^6
Hf-173	10^2	10^6
Hf-175	10^2	10^6
Hf-177m	10	10^5
Hf-178m	10	10^6
Hf-179m	10	10^6
Hf-180m	10	10^6
Hf-181	10	10^6
Hf-182	10^2	10^6
Hf-182m	10	10^6
Hf-183	10	10^6
Hf-184	10^2	10^6
Ta-172	10	10^6
Ta-173	10	10^6
Ta-174	10	10^6
Ta-175	10	10^6
Ta-176	10	10^6
Ta-177	10^2	10^7
Ta-178	10	10^6
Ta-179	10^3	10^7
Ta-180	10	10^6
Ta-180m	10^3	10^7
Ta-182	10	10^4
Ta-182m	10^2	10^6
Ta-183	10^2	10^6
Ta-184	10	10^6
Ta-185	10^2	10^5
Ta-186	10	10^5
W-176	10^2	10^6
W-177	10	10^6
W-178*	10	10^6
W-179	10^2	10^7
W-181	10^3	10^7
W-185	10^4	10^7
W-187	10^2	10^6
W-188*	10^2	10^5
Re-177	10	10^6
Re-178	10	10^6
Re-181	10	10^6
Re-182	10	10^6
Re-182m	10	10^6
Re-184	10	10^6
Re-184m	10^2	10^6
Re-186	10^3	10^6
Re-186m	10^3	10^7
Re-187	10^6	10^9
Re-188	10^2	10^5
Re-188m	10^2	10^7
Re-189*	10^2	10^6
Os-180	10^2	10^7
Os-181	10	10^6
Os-182	10^2	10^6
Os-185	10	10^6
Os-189m	10^4	10^7
Os-191	10^2	10^7
Os-191m	10^3	10^7
Os-193	10^2	10^6
Os-194	10^2	10^5
Ir-182	10	10^5
Ir-184	10	10^6
Ir-185	10	10^6
Ir-186	10	10^6
Ir-186m	10	10^6

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Ir-187	10^2	10^6
Ir-188	10	10^6
Ir-189*	10^2	10^7
Ir-190	10	10^6
Ir-190m (3,1 h)	10	10^6
Ir-190m' (1,2 h)	10^4	10^7
Ir-192	10	10^4
Ir-192m	10^2	10^7
Ir-193m	10^4	10^7
Ir-194	10^2	10^5
Ir-194m	10	10^6
Ir-195	10^2	10^6
Ir-195m	10^2	10^6
Pt-186	10	10^6
Pt-188*	10	10^6
Pt-189	10^2	10^6
Pt-191	10^2	10^6
Pt-193	10^4	10^7
Pt-193m	10^3	10^7
Pt-195m	10^2	10^6
Pt-197	10^3	10^6
Pt-197m	10^2	10^6
Pt-199	10^2	10^6
Pt-200	10^2	10^6
Au-193	10^2	10^7
Au-194	10	10^6
Au-195	10^2	10^7
Au-198	10^2	10^6
Au-198m	10	10^6
Au-199	10^2	10^6
Au-200	10^2	10^5
Au-200m	10	10^6
Au-201	10^2	10^6
Hg-193	10^2	10^6
Hg-193m	10	10^6
Hg-194*	10	10^6

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Hg-195	10^2	10^6
Hg-195m*	10^2	10^6
Hg-197	10^2	10^7
Hg-197m	10^2	10^6
Hg-199m	10^2	10^6
Hg-203	10^2	10^5
Tl-194	10	10^6
Tl-194m	10	10^6
Tl-195	10	10^6
Tl-197	10^2	10^6
Tl-198	10	10^6
Tl-198m	10	10^6
Tl-199	10^2	10^6
Tl-200	10	10^6
Tl-201	10^2	10^6
Tl-202	10^2	10^6
Tl-204	10^4	10^4
Pb-195m	10	10^6
Pb-198	10^2	10^6
Pb-199	10	10^6
Pb-200	10^2	10^6
Pb-201	10	10^6
Pb-202	10^3	10^6
Pb-202m	10	10^6
Pb-203	10^2	10^6
Pb-205	10^4	10^7
Pb-209	10^5	10^6
Pb-210*	10	10^4
Pb-211	10^2	10^6
Pb-212*	10	10^5
Pb-214	10^2	10^6
Bi-200	10	10^6
Bi-201	10	10^6
Bi-202	10	10^6
Bi-203	10	10^6
Bi-205	10	10^6

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Bi-206	10	10^5
Bi-207	10	10^6
Bi-210	10^3	10^6
Bi-210m*	10	10^5
Bi-212*	10	10^5
Bi-213	10^2	10^6
Bi-214	10	10^5
Po-203	10	10^6
Po-205	10	10^6
Po-206	10	10^6
Po-207	10	10^6
Po-208	10	10^4
Po-209	10	10^4
Po-210	10	10^4
At-207	10	10^6
At-211	10^3	10^7
Fr-222	10^3	10^5
Fr-223	10^2	10^6
Rn-220*	10^4	10^7
Rn-222*	10	10^8
Ra-223*	10^2	10^5
Ra-224*	10	10^5
Ra-225	10^2	10^5
Ra-226*	10	10^4
Ra-227	10^2	10^6
Ra-228*	10	10^5
Ac-224	10^2	10^6
Ac-225*	10	10^4
Ac-226	10^2	10^5
Ac-227*	0.1	10^3
Ac-228	10	10^6
Th-226*	10^3	10^7
Th-227	10	10^4
Th-228*	1	10^4
Th-229*	1	10^3
Th-230	1	10^4

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Th-231	10^3	10^7
Th-232	10	10^4
$Th_{přír}$	1	10^3
Th-234*	10^3	10^5
Pa-227	10	10^6
Pa-228	10	10^6
Pa-230	10	10^6
Pa-231	1	10^3
Pa-232	10	10^6
Pa-233	10^2	10^7
Pa-234	10	10^6
U-230*	10	10^5
U-231	10^2	10^7
U-232*	1	10^3
U-233	10	10^4
U-234	10	10^4
U-235*	10	10^4
U-236	10	10^4
U-237	10^2	10^6
U-238*	10	10^4
U_{natur}*	1	10^3
U-239	10^2	10^6
U-240	10^3	10^7
U-240*	10	10^6
Np-232	10	10^6
Np-233	10^2	10^7
Np-234	10	10^6
Np-235	10^3	10^7
Np-236	10^2	10^5
Np-236m	10^3	10^7
Np-237*	1	10^3
Np-238	10^2	10^6
Np-239	10^2	10^7
Np-240	10	10^6
Pu-234	10^2	10^7
Pu-235	10^2	10^7

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Pu-236	10	10^4
Pu-237	10^3	10^7
Pu-238	1	10^4
Pu-239	1	10^4
Pu-240	1	10^3
Pu-241	10^2	10^5
Pu-242	1	10^4
Pu-243	10^3	10^7
Pu-244	1	10^4
Pu-245	10^2	10^6
Pu-246	10^2	10^6
Am-237	10^2	10^6
Am-238	10	10^6
Am-239	10^2	10^6
Am-240	10	10^6
Am-241	1	10^4
Am-242	10^3	10^6
Am-242m*	1	10^4
Am-243*	1	10^3
Am-244	10	10^6
Am-244m	10^4	10^7
Am-245	10^3	10^6
Am-246	10	10^5
Am-246m	10	10^6
Cm-238	10^2	10^7
Cm-240	10^2	10^5
Cm-241	10^2	10^6
Cm-242	10^2	10^5
Cm-243	1	10^4
Cm-244	10	10^4
Cm-245	1	10^3
Cm-246	1	10^3
Cm-247	1	10^4
Cm-248	1	10^3
Cm-249	10^3	10^6
Cm-250	0.1	10^3

Nuclide	Specific activity [kBq/kg]	Activity [Bq]
Bk-245	10^2	10^6
Bk-246	10	10^6
Bk-247	1	10^4
Bk-249	10^3	10^6
Bk-250	10	10^6
Cf-244	10^4	10^7
Cf-246	10^3	10^6
Cf-248	10	10^4
Cf-249	1	10^3
Cf-250	10	10^4
Cf-251	1	10^3
Cf-252	10	10^4
Cf-253	10^2	10^5
Cf-254	1	10^3
Es-250	10^2	10^6
Es-251	10^2	10^7
Es-253	10^2	10^5
Es-254	10	10^4
Es-254m	10^2	10^6
Fm-252	10^3	10^6
Fm-253	10^2	10^6
Fm-254	10^4	10^7
Fm-255	10^3	10^6
Fm-257	10	10^5
Md-257	10^2	10^7
Md-258	10^2	10^5

Legend:

A moderate amount of radioactive substance is considered to be an amount less than 1 tonne.
Specific activity and activity values for nuclides marked with * (parent nuclides) also include their decay products (progeny) with which they are in radioactive equilibrium.
Progeny that are in radioactive equilibrium with their parent nuclide are not assessed independently.

Parent nuclides and corresponding progeny in radioactive equilibrium

Parent nuclide	Progeny
Ge-68	Ga-68
Rb-83	Kr-83m
Sr-82	Rb-82
Sr-90	Y-90
Y-87	Sr-87m
Zr-93	Nb-93m
Zr-97	Nb-97
Mo-99	Tc-99m
Ru-106	Rh-106
Ag-108m	Ag-108
Sn-121m	Sn-121 (0.776)
Sn-126	Sb-126m
Xe-122	I-122
Cs-137	Ba-137m
Ba-140	La-140
Ce-134	La-134
Ce-144	Pr-144
Gd-146	Eu-146
Hf-172	Lu-172
W-178	Ta-178
W-188	Re-188
Re-189	Os-189m (0.241)
Ir-189	Os-189m
Pt-188	Ir-188
Hg-194	Au-194
Hg-195m	Hg-195 (0.542)
Pb-210	Bi-210, Po-210
Pb-212	Bi-212, Tl-208 (0.36), Po-212 (0.64)
Bi-210m	Tl-206
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

Parent nuclide	Progeny
Ac-225	Fr-221, At-217, Bi-213, Po-213 (0.978), Tl-209 (0.0216), Pb-209 (0.978)
Ac-227	Fr-223 (0.0138)
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
$Th_{přír}$	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
$U_{přír}$	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
U-240	Np-240m
Np-237	Pa-233
Am-242m	Am-242
Am-243	Np-239

Surface activity exemption levels for surface contamination of items

Radionuclide source type	Surface activity [Bq/cm^2]
Radionuclide sources emitting beta or gamma radiation, and low-toxicity radionuclide sources emitting alpha radiation	0.4
Other radionuclide sources emitting alpha radiation	0.04

Legend:

Low-toxic radionuclide sources emitting alpha radiation are as follows:

1. natural uranium, depleted uranium, natural thorium, Th-228, Th-230, Th-232, U-235, and U-238 is contained in ores or chemical concentrates, or
2. radioactive source emitting alpha radiation with a half-life of less than ten days.

Annex 8 to Decree No. 422/2016 Coll.

Activity levels of highly active sources

Element (atomic number)	Radionuclide	The activity level defining the highly active source [TBq]
Americium (95)	Am-241	$6. 10^{-2}$
	Am-241/Be-9 ([1])	$6. 10^{-2}$
Californium (98)	Cf-252	$2. 10^{-2}$
Curium (96)	Cm-244	$5. 10^{-2}$
Cobalt (27)	Co-60	$3. 10^{-2}$
Caesium (55)	Cs-137	$1. 10^{-1}$
Gadolinium (64)	Gd-153	$1. 10^{0}$
Iridium (77)	Ir-192	$8. 10^{-2}$
Promethium (61)	Pm-147	$4. 10^{1}$
Plutonium (94)	Pu-238	$6. 10^{-2}$
	Pu-239/Be-9([1])	$6. 10^{-2}$
Radium (88)	Ra-226	$4. 10^{-2}$
Selenium (34)	Se-75	$2. 10^{-1}$
Strontium (38)	Sr-90 (Y-90)	$1. 10^{0}$
Thulium (69)	Tm-170	$2. 10^{1}$
Ytterbium (70)	Yb-169	$3. 10^{-1}$

Legend:

([1]) Activity is the activity of a radionuclide emitting alpha radiation.
For radionuclides not listed in the table, the relevant activity is the same as the D-value specified in Annex 1 to this Decree.

Annex 9 to Decree No. 422/2016 Coll.

Workplace with an open radionuclide source

1. Standard equipment requirements for a workplace with an open radionuclide source for purposes of its categorisation

Workplace category	Requirements for standard workplace ventilation, insulation, and shading devices and sewer system design
I.	Like a normal chemical laboratory, walls and ceiling with a washable and non-porous surface, floor covered with a durable, easy-to-clean floor material, for example PVC, work surfaces made of easy-to-clean material, especially laminate or stainless steel, solid and seamless, sinks from easy-to-clean material, can be directly connected to the sewer system.
II.	Like a well-equipped chemical laboratory, in addition to the requirements for Category I workplaces, also sealed joints between floor, walls, ceiling, and work surfaces, exhaust hood, drains usually connected to a separate retention tank.
III. and IV.	Like a very well-equipped chemical laboratory, in addition to requirements for a Category II workplace, also equipped with vacuum chambers and drains connected to a separate retention tank.

2. The highest activities processed in a workplace with standard equipment

Workplace category	Characteristics of radioactive substances and conditions of working with them			
	Normal	Under wet conditions	Volatile liquids	Potentially dusty
Category I	60 Sv/h_{inh}	3 000 Sv/h_{inh}	1 Sv/h_{inh}	3 Sv/h_{inh}
Category II	600 Sv/h_{inh}	30 000 Sv/h_{inh}	150 Sv/h_{inh}	600 Sv/h_{inh}
Category III	8 000 Sv/h_{inh}	300 000 Sv/h_{inh}	1 600 Sv/h_{inh}	8 000 Sv/h_{inh}
Category IV	unspecified	unspecified	unspecified	unspecified

Legend:

1. For natural uranium and thorium, depleted and enriched uranium, radionuclides Sm-147, Th-232, U-235, and U-238, ten times the values listed in the table will be used.
2. Conversion factors h_{inh} for intake via inhalation are stipulated in Annex 3 to this Decree.
3. The characteristics of radioactive substances and conditions of work with them depending on the physical characteristics of the processed materials and on the difficulty and risk level of work operations are provided in the table below.
4. If workplace equipment does not conform to the standard facilities of a workplace of the given category, the highest activity that can be processed at such a workplace is determined by multiplying the appropriate activity from the previous table by a workplace availability coefficient according to the table below.
5. If multiple radionuclides are processed simultaneously at one workplace, the sum of shares of processed activities of individual radionuclides and their maximum processed activities must not be greater than 1.
6. If work at a Category III workplace involves only an open radionuclide source fixed on a permanent medium, activity restriction does not apply.

3. Characteristics of radioactive substances and method of work with them depending on the physical characteristics of the processed materials and on the difficulty and risk level of work operations

Characteristics of radioactive substances and conditions of work with them	Physical characteristics of radioactive substances processing the difficulty and potential risk level of work activities
Normal	Work activities with dry solid radioactive substances, especially weighing, separation, heating, breeding of laboratory animals with applied radionuclides.
Under wet conditions	Work activities with radioactive substances in solution, aside from volatile liquids.
Volatile liquids	Work activities with tritiated liquids, marked organic liquids, solutions with radioactive iodine, or with other liquids where there is a possibility of radioactive fumes or air contamination.
Potentially dusty	Work activities with dry solid radioactive substances, where there is the possibility of significant quantities of respirable dust, in particular grinding, crushing, or milling of substances and pouring of dry dusty materials.

4. Workplace equipment coefficients

Workplace equipment	Workplace category		
	I.	II.	III. and IV.
Hermetic vacuum chamber with gloves or manipulators	10	10	1
Semi-hermetic vacuum chamber	10	1	0.1
A closed elution or similar system, radiochemical fume hood, a laminar flow chamber	1	1	0.1
An open surface or worktable in a room with downward laminar flow	0.1	0.1	0.01
A normal chemical fume hood, chamber without ventilation, especially protective shield, tent	0.1	0.01	0.001
Open area, work table	0.01	0.001	0.0001

Annex 10 to Decree No. 422/2016 Coll.

Procedures for verifying the seal on a sealed radionuclide source

1. The seal on a sealed radionuclide source must be tested by:
   1.1. immersing it in a liquid;
   1.2. wiping the sealed radionuclide source;
   1.3. wiping it on a substitute surface; or
   1.4. performing an emanation test.
2. A leak test of a sealed radionuclide source that is part of acceptance testing or long-term stability testing of equipment with a sealed radionuclide source performed pursuant to § 26(2)(d)(5) or § 28(1)(b)(5) must be performed by wiping it on a substitute surface.
3. Unless a different value is recommended, a sealed radionuclide source is considered to leak if during the leak test the following limit values for test media activity were exceeded:
   3.1. for the liquid immersion test, 200 Bq;
   3.2. for a wipe test of a sealed radionuclide source, 200 Bq;
   3.3. for a wipe test on a substitute test surface, 20 Bq; or
   3.4. for an emanation test, 200 Bq over twelve hours.

Annex 11 to Regulation No. 422/2016 Coll.

Frequency of the long-term stability test for a sealed radionuclide source

Frequency of the long-term stability test for a sealed radionuclide source for which the recommended duration of use has not expired

Enclosed radionuclide source type	Conditions of use		
	Light [*1]	Normal [*2]	Difficult [*3]
Flat sealed radionuclide source emitting alpha radiation	5 years	36 months	12 months
Flat sealed radionuclide source emitting beta radiation with activity greater than 40 MBq/cm^2	10 years	5 years	24 months
Flat sealed radionuclide source emitting beta radiation with activity less than 40 MBq/cm^2, and with a thick overlay	15 years	10 years	36 months
Single-layer sealed radioactive source emitting gamma radiation with lower activity	15 years	10 years	36 months
Double-layer sealed radioactive source	15 years	10 years	36 months
Sealed radionuclide source emitting low-energy photons	10 years	5 years	24 months

Legend:

[*1] - Light conditions of use (a non-aggressive environment in an inaccessible area, without risk of physical damage, for example surveillance radionuclide dosimetry sources);
[*2] - normal conditions of use (a non-aggressive industrial environment, for example charge eliminators or thickness meters in the textile, paper, or plastics industry);
[*3] - difficult conditions of use (an aggressive environment or an increased risk of physical damage, for example rubber factories).

Frequency of the long-term stability test for a sealed radionuclide source for which the recommended duration of use has expired

Enclosed radionuclide source type	All conditions of use
Single-layer sealed radioactive source	12 months
Double-layer sealed radioactive source	24 months

Annex 12 to Decree No. 422/2016 Coll.

Categorisation of defects identified during a long-term stability test

1. Defects discovered in a source of ionising radiation used in medical irradiation in radiotherapy are as follows:
   1.1. very serious defects, as follows:
      1.1.1. leakage of the sealed radionuclide source; or
      1.1.2. a serious defect or a serious combination of defects that could pose a risk to patient or worker health or that violate the principles of radiation protection in a serious manner; or
   1.2. less serious defects, as follows:
      1.2.1. visible damage to the sealed radionuclide source that could lead to a leak in the near future and that is not a very serious defect; or
      1.2.2. other defects found during a long-term stability test not specified in points 1.1 or 1.2.1.
2. Defects discovered in a source of ionising radiation used in medical irradiation in radiodiagnostics or interventional radiology are as follows:
   2.1. very serious defects, as follows:
      2.1.1. a functional defect or combination of functional defects that could pose a direct risk to the health of the patient;
      2.1.2. the occurrence of significant artefacts completely precluding diagnostic reading of the image;
      2.1.3. for radiography and fluoroscopy X-ray devices, the first half-thickness at 80 kV of less than 2.3 mm Al;
      2.1.4. on radiographic X-ray equipment
         2.1.4.1. a voltage deviation from the nominal value of more than 20 %;
         2.1.4.2. with a film image receptor without automatic exposure, short-term absorbed dose reproducibility during identical exposure parameters greater than 20 %;
         2.1.4.3. with a film image receptor, reproducibility of exposure automation greater than 40 %; or
         2.1.4.4. spatial resolution of less than 1.6 lp/mm;
      2.1.5. for fluoroscopic X-ray devices
         2.1.5.1. the sum of the deviations of the edges of the X-ray field and image receptor on all sides greater than 10 % of the distance from the point of focus to the image receptor;
         2.1.5.2. low contrast detectability greater than 4 %; or
         2.1.5.3. spatial resolution less than 1.6 lp/mm;
      2.1.6. on computed tomography devices, a decline of the dose index by 70 % or more from the baseline value at the same exposure parameters; or
      2.1.7. a serious defect or a serious combination of defects that could pose a risk to patient or worker health or that violate the principles of radiation protection in a serious manner; or
   2.2. less serious defects, these being other defects discovered during the long-term stability test not mentioned in point 2.1.

3. Defects discovered in a source of ionising radiation used in defectoscopy and well logging are as follows:
   3.1. very serious defects, as follows:
      3.1.1. leakage of the sealed radionuclide source; or
      3.1.2. a serious defect or a serious combination of defects that could pose a risk to the health or workers or other individuals or that violate the principles of radiation protection in a serious manner; or
   3.2. less serious defects, these being other defects discovered during the long-term stability test not mentioned in point 3.1.
4. Defects found in other sources of ionising radiation not mentioned in points 1 to 3 are as follows:
   4.1. very serious defects, as follows:
      4.1.1. a functional defect or combination of functional defects that could pose a direct risk to the health of workers or other individuals;
      4.1.2. leakage of the sealed radionuclide source; or
      4.1.3. a serious defect or a serious combination of defects that could pose a risk to the health or workers or other individuals or that violate the principles of radiation protection in a serious manner; or
   4.2. less serious defects, as follows:
      4.2.1. visible damage to the sealed radionuclide source that could lead to a leak in the near future and that is not a very serious defect; or
      4.2.2. other defects found during a long-term stability test not specified in points 4.1 or 4.2.1.

Legend:

An artefact is an undesirable presence on an image that is not related to the imaged object and impairs its visibility

Annex 13 to Decree No. 422/2016 Coll.

Performance constancy tests performed by the registrant

The registrant must carry out performance constancy tests

1. of intra-oral dental x-ray equipment
   - 1.1. with a film image receptor, via visual comparison of a dental phantom image taken with the exposure parameters commonly used for an adult's upper molar with a reference image
     - 1.1.1. at least once a month;
     - 1.1.2. upon each suspected malfunction of the ionising radiation source or of the imaging process;
     - 1.1.3. upon a change that is important in terms of radiation protection;
     - 1.1.4. after more than 1 month of inactivity;
     - 1.1.5. after changing films or chemicals;
     - 1.1.6. if a deviation is detected during tests carried out within the scope of points 1.1.1 to 1.1.5; and
     - 1.1.7. if a deviation under point 1.1.6 is confirmed, after corrective measures, using modified exposure parameters resulting from the corrective measures;
   - 1.2. with direct digitisation
     - 1.2.1. via visual comparison of a dental phantom image taken with the exposure parameters commonly used for an adult's upper molar with a reference image
       - 1.2.1.1. at least once a year;
       - 1.2.1.2. upon each suspected malfunction of the ionising radiation source or of the imaging process;
       - 1.2.1.3. upon a change that is important in terms of radiation protection;
       - 1.2.1.4. after more than 1 year of inactivity;
       - 1.2.1.5. if a deviation is detected during tests carried out within the scope of points 1.2.1.1 to 1.2.1.4; and
       - 1.2.1.6. if a deviation under point 1.2.1.5 is confirmed, after corrective measures, using modified exposure parameters resulting from the corrective measures;
     - 1.2.2. via a visual check of the cleanliness of the monitor used for clinical diagnosis;
       - 1.2.2.1. once per month; and
       - 1.2.2.2. if monitor contamination is found under point 1.2.2.1, after corrective measures;
   - 1.3. with indirect digitisation
     - 1.3.1. via visual comparison of a dental phantom image taken with the exposure parameters commonly used for an adult's upper molar with a reference image
       - 1.3.1.1. at least once a year;
       - 1.3.1.2. upon each suspected malfunction of the ionising radiation source or of the imaging process;
       - 1.3.1.3. upon a change that is important in terms of radiation protection;
       - 1.3.1.4. after more than 1 year of inactivity;
       - 1.3.1.5. if a deviation is detected during tests carried out within the scope of points 1.3.1.1 to 1.3.1.4; and
       - 1.3.1.6. if a deviation under point 1.3.1.5 is confirmed, after corrective measures, using modified exposure parameters resulting from the corrective measures;
     - 1.3.2. via a visual check of the cleanliness of the monitor used for clinical diagnosis;

1.3.2.1. once per month; and
1.3.2.2. if monitor contamination is found under point 1.3.2.1, after corrective measures;
1.3.3. via a visual check whether on dental phantom images taken, all indirect digitisation films used do not show significant artefacts affecting the diagnostic reading of images;
1.3.3.1. once per month; and
1.3.3.2. after acquiring new indirect digitisation films;
2. of panoramic dental X-ray equipment
2.1. with direct digitisation
2.1.1. with a jaw phantom imaging test performed according to the equipment manufacturer's instructions, or if the manufacturer did not provide such instructions, according to the instructions of the person who performed the long-term stability test or acceptance test
2.1.1.1. once every 6 months;
2.1.1.2. upon each suspected malfunction of the ionising radiation source or of the imaging process;
2.1.1.3. upon a change that is important in terms of radiation protection;
2.1.1.4. after more than 6 months of inactivity; and
2.1.1.5. if shortcomings are found within the scope of points 2.1.1.1 to 2.1.1.4, after corrective measures;
2.1.2. via a visual check of the cleanliness of the monitor used for clinical diagnosis;
2.1.2.1. once per month; and
2.1.2.2. if monitor contamination is found under point 2.1.2.1, after corrective measures;
2.2. with a jaw phantom film imaging test performed according to the equipment manufacturer's instructions, or if the manufacturer did not provide such instructions, according to the instructions of the person who performed the long-term stability test or acceptance test
2.2.1. once every 3 months;
2.2.2. upon each suspected malfunction of the ionising radiation source or of the imaging process;
2.2.3. upon a change that is important in terms of radiation protection;
2.2.4. after more than 3 months of inactivity; and
2.2.5. if shortcomings are found within the scope of points 2.2.1 to 2.2.4, after corrective measures;
2.3. with indirect digitisation
2.3.1. with a jaw phantom imaging test performed according to the equipment manufacturer's instructions, or if the manufacturer did not provide such instructions, according to the instructions of the person who performed the long-term stability test or acceptance test
2.3.1.1. once every 3 months;
2.3.1.2. upon each suspected malfunction of the ionising radiation source or of the imaging process;
2.3.1.3. upon a change that is important in terms of radiation protection;
2.3.1.4. after more than 3 months of inactivity; and
2.3.1.5. if shortcomings are found within the scope of points 2.3.1.1 to 2.3.1.4, after corrective measures;
2.3.2. via a visual check of the cleanliness of the monitor used for clinical diagnosis;
2.3.2.1. once per month; and

2.3.2.2. if monitor contamination is found under point 2.3.2.1, after corrective measures;

2.3.3. via a visual check whether on images taken, all indirect digitisation films used do not show significant artefacts affecting the diagnostic reading of images;

2.3.3.1. once every 3 months; and

2.3.3.2. after acquiring new indirect digitisation films;

3. of dental X-ray equipment for which a negatoscope is used to evaluate images, tests pursuant to point 1 or 2 plus a visual check of negatoscope cleanliness;
   3.1. once per month; and
   3.2. if negatoscope contamination is found under point 3.1, after corrective measures;
4. of dental computed tomography equipment
   4.1. with a phantom imaging test performed according to the equipment manufacturer's instructions, or if the manufacturer did not provide such instructions, according to the instructions of the person who performed the long-term stability test or acceptance test;
      4.1.1. once every 6 months;
      4.1.2. upon each suspected malfunction of the ionising radiation source or of the imaging process;
      4.1.3. upon a change that is important in terms of radiation protection;
      4.1.4. after more than 6 months of inactivity; and
      4.1.5. if shortcomings are found within the scope of points 4.1.1 to 4.1.4, after corrective measures;
   4.2. via a visual check of the cleanliness of the monitor used for clinical diagnosis;
      4.2.1. once per month; and
      4.2.2. if monitor contamination is found under point 4.2.1, after corrective measures;
5. of veterinary X-ray equipment
   5.1. by checking the condition and integrity of protective aids
      5.1.1. once per year,
      5.1.2. after their repairs and
      5.1.3. after the acquisition of new protective aids,
   5.2. of veterinary radiography equipment via a test of alignment of the light field with the X-ray field
      5.2.1. once every 6 months;
      5.2.2. upon a change that is important in terms of radiation protection; and
      5.2.3. in the case of unsatisfactory results of tests pursuant to points 5.2.1 and 5.2.2, after corrective measures are performed;
   5.3. of veterinary fluoroscopic equipment via a test of x-ray field alignment with the image receptor
      5.3.1. once every 6 months;
      5.3.2. upon a change that is important in terms of radiation protection; and
      5.3.3. in the case of unsatisfactory results of tests pursuant to points 5.3.1 and 5.3.2, after corrective measures are performed;
   5.4. of veterinary X-ray equipment not listed in points 5.2 and 5.3 to the extent and frequency stipulated
      5.4.1. by the manufacturer; or
      5.4.2. by the person who performed the acceptance test or long-term stability test;
6. of an X-ray bone densitometer to the extent stipulated by the manufacturer
   6.1. prior to first use;
   6.2. after servicing;
   6.3. with the frequency as stipulated by the manufacturer; and

6.4. if a discrepancy is found during a test pursuant to points 6.1 to 6.3, after corrective measures.

Legend:

An artefact is an undesirable presence on an image that is not related to the imaged object and impairs its visibility

Annex 14 to Decree No. 422/2016 Coll.

Information regarding a Category A radiation worker and information characterising his or her expected exposure

1. Identification of the permit holder, for whom the radiation worker performs work during which he or she is occupationally irradiated: the name and address of the permit holder and the name and address of the workplace;
2. the radiation worker's name, or names, and surname;
3. the radiation worker's title, if he has one;
4. the radiation worker's education;
5. birth number, if it was issued, or in the case of foreign nationals, residency permit number;
6. date of birth;
7. place of birth;
8. the date of commencement of work with sources of ionising radiation and total time working with sources of ionising radiation;
9. the date work with sources of ionising radiation began at this workplace and the date work with sources of ionising radiation ended at this workplace;
10. the date monitoring of the exposed worker began;
11. the date monitoring of the exposed worker ended;
12. the workplace number assigned by the personal dosimetry permit holder;
13. dosimeter type and number, including information on the duration of the assessment period;
14. information regarding what type of dosimeter the worker is equipped with, and, in the case of internal exposure, how this exposure is assessed;
15. information on the healthcare provider providing preventive examinations of the radiation worker;
16. information on what type of ionising radiation the exposed worker is working with;
17. information regarding the type of radiation the exposed worker is exposed to;
18. information on the radiation worker's profession;
19. information on whether he or she is a full-time employee of the permit holder;
20. the date up to which this information is valid; and
21. the supervisor's name.

Annex 15 to Decree No. 422/2016 Coll.

Sample personal radiation badge

STÁTNÍ ÚŘAD PRO JADERNOU BEZPEČNOST
110 00 Praha 1, Senovážné náměstí 9

Registrační číslo:
Registration No.:
№ регистрации:

OSOBNÍ RADIAČNÍ PRŮKAZ

PERSONAL RADIATION PASSPORT

ЛИЧНОЕ РАДИАЦИОННОЕ УДОСТОВЕРЕНИЕ

STÁTNÍ ÚŘAD PRO JADERNOU BEZPEČNOST
110 00 Praha 1, Senovážné náměstí 9

Registrační číslo:
Registration No.:
№ регистрации:

Část A

Part A Часть А

<table>
<tr><td>1. Příjmení
Surname
Фамилия</td><td colspan="3"></td><td rowspan="3">Foto
Photo
Фотография</td></tr>
<tr><td>2. Jméno
First name
Имя, отчество</td><td colspan="3"></td></tr>
<tr><td>3. Pohlaví
Gender
Пол</td><td>mužské
male
мужской
☐</td><td>ženské
female
женский
☐</td><td>4. Datum narození
Date of Birth
Дата рождения
- - . - - . - - - -</td></tr>
<tr><td colspan="3">5. Osobní kód[1]
Personal Code
Личный код</td><td colspan="2"></td></tr>
<tr><td colspan="3">6. Státní příslušnost
Country
Гражданство</td><td colspan="2"></td></tr>
<tr><td colspan="3">7. Číslo občanského průkazu[2),3)]
Identity Card No
№ гражданского паспорта</td><td colspan="2"></td></tr>
<tr><td colspan="3">8. Číslo pasu[3)]
Passport No
№ заграничного паспорта</td><td colspan="2"></td></tr>
<tr><td colspan="3">9. Datum vydání
Date of Issue
Дата выдачи</td><td colspan="2"></td></tr>
</table>

1) osobní kód pracovníka přidělí SÚJB
personal code of worker assigns the SÚJB
личный код работника сообщит *ГКЯБ (SÚJB)*

2) vyplní pouze občan ČR
introduced only by the Czech resident
выполняет только гражданин ЧР

3) případnou změnu v těchto údajích oznamte SÚJB a předložte průkaz k zaznamenání této změny
notify SUJB about the change of these details and present the passport for recording of this change
возможное изменение данных сообщите ГКЯБ и предъявите удостоверение для отмечения изменения

STÁTNÍ ÚŘAD PRO JADERNOU BEZPEČNOST
110 00 Praha 1, Senovážné náměstí 9

Registrační číslo:
Registration No.:
№ регистрации:

Roční efektivní dávky (mSv)
Annual effective doses (mSv)
Годовые эффективные дозы (mSv)

Rok *Year* **Год**	$H_{P(10)}$	E_{50}	E	$H_{T1^{*)}}$	$H_{T2^{*)}}$	**Datum**[4] **Date** *Дата*	*Jméno a podpis*[5] Surname and Signature *ФИО и подпись*
V předchozích 4 letech *Past 4 years* В течение 4 предыдущих лет							

4) uveďte datum zápisu
write the date of data introduction
дата записи

5) vyplňuje dohlížející osoba
completed by the radiation protection officer
выполняет лицо с профессиональной пригодностью

*) specifikujte orgán nebo tkáň, pro které je ekvivalentní dávka stanovena
specifity the organ or tissue, for that the equivalent dose is evaluated
определите орган или ткань для которой была установлена эквивалентная доза

STÁTNÍ ÚŘAD PRO JADERNOU BEZPEČNOST
110 00 Praha 1, Senovážné náměstí 9

Registrační číslo:
Registration No.:
№ регистрации:

Údaje o držiteli povolení[6)]

Data on licensee

Данные о обладателе разрешения/лицензии

Název, adresa: *Name, address* Название, адрес Evidenční č.[8)]: *Evidence No.:* № регистрации: Č. povolení *No. of licence* № разрешения	Začátek práce se ZIZ (zdroj ionizujícího záření)[7)] *Beginning of work with SIR* *(source of ionizing radiation)* Начало работы с ИИИ (источник ионизирующего излучения) Konec práce se ZIZ *End of work with SIR* Конец работы с ИИИ
Název, adresa: Evidenční č. Č. povolení	Začátek práce se ZIZ Konec práce se ZIZ
Název, adresa: Evidenční č. Č. povolení	Začátek práce se ZIZ Konec práce se ZIZ
Název, adresa: Evidenční č. Č. povolení	Začátek práce se ZIZ Konec práce se ZIZ

6) je myšlen držitel povolení, který je osobou odpovědnou za radiační ochranu externího pracovníka
it means the undertaking or employer
обладатель разрешения ответственный за радиационную безопасность заочного сотрудника

7) je myšlen začátek práce externího pracovníka u uvedeného držitele povolení
it means the beginning of the work of worker for introduced outside undertaking
начало работы заочного сотрудника у обладателя разрешения

8) uveďte evidenční číslo přidělené SÚJB v souladu s § xxz zákona č. xxx Sb.- vyplní pouze držitelé povolení v ČR
introduced only by the Czech licensee
запольняет только обладатель разрешения/лицензии в ЧР

STÁTNÍ ÚŘAD PRO JADERNOU BEZPEČNOST
110 00 Praha 1, Senovážné náměstí 9

Registrační číslo:
Registration No.:
№ регистрации:

Záznamy o absolvovaných školeních z radiační ochrany:
Records of the radiation protection training:
Данные о инструктажи по радиационной безопасности:

Datum *Date* Дата	**Jméno a podpis:** 11) *Surname and signature:* ФИО и подпись:

11) vyplňuje dohlížející osoba
is filled by a radiation protection officer
заполняет работник надзора

STÁTNÍ ÚŘAD PRO JADERNOU BEZPEČNOST
110 00 Praha 1, Senovážné náměstí 9

Registrační číslo:
Registration No.:
№ регистрации:

Výsledky preventivních lékařských prohlídek
Results of preventive medical survey:
Заключение профилактического медицинского осмотра:

Datum *Date* Дата	**Výsledek preventivní prohlídky** 9) *Result of medical survey* Заключение профилактического осмотра:	**Jméno a podpis:** 10) *Surname and signature:* ФИО и подпись:

9) 1. Schopen Fit Годен / годный
2. Schopen za stanovených podmínek (v tomto případě je nutno doložit lékařskou zprávu se specifikací podmínek, za kterých může být práce vykonávána)
Fit, subject to certain conditions in this case is necessary to enclosed the medical report with the specification of certain conditions of work
Годен / годный в определенных условиях (в этом случае необходимо приложить медицинское заключение с уточнением условий, при выполнении которых можно выполнять данную работу)
3. Neschopen *Unfit* Не годен

10) vyplňuje dohlížející osoba
is filled by radiation protection officer
заполняет работник надзора

STÁTNÍ ÚŘAD PRO JADERNOU BEZPEČNOST
110 00 Praha 1, Senovážné náměstí 9

Registrační číslo:
Registration No.:
№ регистрации:

Obecné zásady používání osobního radiačního průkazu
General rules for use of personal radiation passport
Основные правила использования личного радиационного удостоверения

1. Osobní radiační průkaz (ORP) je vydán a evidován Státním úřadem pro jadernou bezpečnost v souladu s § xx zákona xx Sb.,
   Personal radiation passport (PRP) is issued and registered by State Office for Nuclear Safety (SUJB) in accordance with §xx of the act No. xx Coll.
   Личное радиационное удостоверение (ЛРУ) выдается и регистрируется Государственным комитетом по ядерной безопасности (ГКЯБ) в соответствии с §x закона № xxx Собрания законов.
2. ORP plní funkci tzv. "Individual Radiological Monitoring Document" požadovaného směrnicí Rady 2013/59/Euratom při práci externího pracovníka.
   PRP has the function of "Individual Radiological Monitoring Document" requested by the Council directive 2013/59/Euratom for outside workers.
   ЛРУ действует как *Individual Radiological Monitoring Document»* требуемого распоряжением 2013/59/EURATOM заочного работника
3. ORP musí být vybaven každý externí pracovník kategorie A, který vykonává činnost v kontrolovaném pásmu. Povinnost vybavení externích pracovníků ORP mají osoby odpovědné za radiační ochranu externího pracovníka.
   Every outside worker has to be equipped by PRP. Undertaking or employer is obliged to equip an outside worker with PR.
   Лицо ответственное за радиационную безопасность должно снабдить заочного сотрудника ЛРУ.
4. ORP je nepřenosný. V případě ztráty průkazu musí být ztráta neprodleně oznámena SÚJB a současně musí být podána žádost o vydání nového ORP.
   PRP is not transferable. Loss of PRP must be immediatelly reported to SONS and application fora new PRP must be submitted.
   Немедленно сообщить ГКЯБ одновременно с заявлением о выди нового ЛРУ.
5. Nedílnou součástí ORP je část B používána pro evidenci dávek externího pracovníka v kalendářním roce.
   Part B used for recording of doses during the current year is the integral part of PRP.
   Неотделимой составной частью ЛРУ является часть В, используемая для учета доз работника в текущем году.
6. Platnost části A ORP je do doby zaplnění údaji, nejdéle 10 let, platnost části B je jeden rok.
   Part A is valid until filled with data, no longer than 10 years, part B is valid for one year.
   Часть А ЛРУ действительна пока не будет заполнена данными, максимум действия 10 лет, часть В действительна один год.
7. Část B ORP, kde budou zaznamenány všechny expozice externího pracovníka v daném kalendářním roce včetně vyhodnocené a potvrzené roční dávky se zasílá na SÚJB nejpozději do konce února následujícího kalendářního roku.
   Part B containing data on all exposures of outside worker during the whole year together with results of evaluation of annual effective dose, must be sent to SONS till the end of February of the following year.
   Часть Б ЛРУ, где отмечены все экспозиции заочного сотрудника текущего года, включая потвержденной годовой дозы должна быть отправлена на ГКЯБ не позднее чем до конца февраля последующего года.

8. Vyhodnocené a odeslané celkové roční osobní dávky externího pracovníka uvede dohlížející osoba také v části A ORP.
   Radiation protection officer is obliged to record the annual doses into the part A of PRP.
   Подтвержденные дозы может работник надзора договорной организации данного работника занести также в часть А удостоверения.
9. Provozovatel kontrolovaného pásma, ve kterém externí pracovník vykonává činnost, je povinen vyhodnotit a zaznamenat do ORP dávku obdrženou pracovníkem. Vyhodnocení dávky se provede v souladu se schváleným programem monitorování pro dané kontrolované pásmo. Vyhodnocená dávka se zaznamenává průběžně, nejdéle v jednoměsíčních intervalech.
   The operator of controlled area is obliged to evaluate and record the dose of outside worker. The dose is evaluated in accordance with the approved monitoring programme for the controlled area. The evaluated dose is introduced periodically but at least in once per month.
   Организация, устанавливающая контролируемую зону, в которой работает заочный~~,~~ обязана провести оценку и отметить дозу   полученной сотрудником~~.~~ Оценка дозы дожна проводится в согласии с принятой програмой мониторинга данной контролируемой зоны. Доза отмечивается непрерывно через каждый месяц.
10. Výsledek lékařského vyšetření potvrzuje do části A ORP každoročně osoba odpovědná za radiační ochranu externího pracovníka na základě obdržené lékařské zprávy.
    The result of the medical survey is confirmed by radiation protection officer in accordance with medical report.
    Заключение медосмотра ежегодно подтверждает работник надзора договорной организации на основании полученной медицинской документации.
11. Absolvování školení z radiační ochrany potvrzuje každoročně do části A ORP dohlížející osoba.
    The attendance of radiation protection training is confirmed by radiation protection officer.
    Завершение курса по радиационной безопасности подтверждает ежегодно работник надзора договорной организации данного работника в части А ЛРУ.

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Registrační číslo:
Registration No.:
№ регистрации:

DEFINICE VELIČIN
DEFINITIONS OF QUANTITIES
ОПРЕДЕЛЕНИЕ ВЕЛИЧИН

$H_P(10)$

- **osobní dávkový ekvivalent Hp (10)** je dávkový ekvivalent v daném bodě pod povrchem těla v hloubce tkáně 10 mm,
- *the dose equivalent in the given point under the surface of body, at a depth of tissue d,*
- эквивалент индивидуальной дозы Hp (10), это эквивалент дозы в данной точке под поверхностью тела на глубине ткани 10 мм,

E_{50}

- **úvazek efektivní dávky E (50)** je časový integrál příkonu efektivní dávky po dobu 50 roků od příjmu radionuklidů,
- *a time integral of the effective or equivalent dose rate over time 50 years from a radionuclide intake,*
- ожидаемая эффективная доза E (50), это интеграл по времени мощности эффективной дозы в течение 50 лет от приема радионуклидов,

H_T

- **ekvivalentní dávka** je součin radiačního váhového faktoru wR a střední absorbované dávky v orgánu nebo tkáni T pro ionizující záření R, nebo součet takových součinů, jestliže pole ionizujícího záření je složeno z více druhů nebo energií,
- *the product of the radiation weighting factor wR and the medium absorbed dose DTR in the organ or in the tissue T for the ionising radiation R, or the sum of such products, if a field of ionising radiation is composed of several radiation kinds or energies,*
- эквивалентная доза, это произведение удельного радиационного фактора wR и средней поглощенной дозы в органе или ткани T для ионизирующего излучения R, или сумма таких произведений в случае, если поле ионизирующего излучения состоит из нескольких видов или энергий,

H_{EXTR}

- **dávkový ekvivalent H**, je součin absorbované dávky v bodě uvažované tkáně nebo orgánu (např. končetiny, oční čočky, apod.) a jakostního činitele Q vyjadřujícího rozdílnou biologickou účinnost různých druhů záření,
- *dose equivalent, which is a product of absorbed doses in the given point of tissue and a quality factor Q, expressing the different biological effectiveness of different kinds of radiation,*
- эквивалент дозы H, это произведение поглощенной дозы в точке учитываемой ткани или органа (например конечности, глазной хрусталик, и т.д.) и качественного множителя Q, выражающего различную биологическую эффективность разных видов излучения,

E

- **efektivní dávka E**, je součet součinů tkáňových váhových faktorů wT a ekvivalentní dávky HTv ozářených tkáních nebo orgánech T,
- *a sum of the products of the tissue weighting factors wT, and the equivalent dose HT in the irradiated tissues or organs T,*
- эффективная доза E, это сумма произведений удельных тканевых факторов wT и эквивалентных доз HT в облученных тканях или органах T.

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Registrační číslo:
Registration No.:
№ регистрации:

Část B

Part B
Часть B

1. **Příjmení** *Surname* Фамилия	
2. **Jméno** *First name* Имя, отчество	
3. **Osobní kód**[1)] *Personal Code* Личный код	
5. **Evidenční číslo držitele povolení**[2)] *Registration number of outside undertaking* № регистрации обладателя разрешения/лицензии	
6. **Datum přidělení této části pracovníkovi** *Date of issue of this part* Дата выдачи этой части сотруднику	

1) registrační číslo je nutno doplnit podle registračního čísla části A
number of registration is necessary to fill in accordance with Part A
№ регистрации должно дополнить согласно Части A

2) vyplňte podle části A
fill in accordance with Part A
дополнить согласно Части A

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Měsíční dávky (mSv) v roce……….[3)]
Month´s Doses in ………. Year
Ежемесячные дозы (mSv) в ……… году

Měsíc *Month* Месяц	H_P (10)	E_{50}	E	H_{T1}	H_{T2}	**Podpis**[4)]
Leden *January* Январь						
Unor *February* Февраль						
Březen *March* Март						
Duben *April* Апрель						
Květen *May* Май						
Červen *June* Июнь						
Červenec *July* Июль						
Srpen *August* Август						
Září *September* Сентябрь						
Říjen *October* Октябрь						
Listopad *November* Ноябрь						
Prosinec *December* Декабрь						
Celkem *Sum* Сумма						

3) Pokud pracovník v jednom monitorovacím období pracuje na více pracovištích musí být jeho monitorování, případně sčítání dávek z měření více dozimetry v tomto období, zajištěno v souladu s programem monitorování.
If outside worker performs activities in more than one controlled area in one monitoring period, it is necessary to manage his personal monitoring or summation of doses from more dosemeters in accordance with monitoring programe
Если сотрудник работает в течении одного монитирированного периода на нескольких рабочих местах, должно быть его монитирирование и считание доз из нескольких дозиметров в согласии с программой монитирирования

4) vyplňuje dohlížející osoba
is filled by a radiation protection officer
заполняет сотрудник надзора

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№ регистрации:

Výsledky osobního monitorování externího pracovníka u provozovatele kontrolovaného pásma [4)]

The results of personal monitoring of outside worker by the controlled area operator

Результаты индивидуального мониторинга заочного сотрудника у эксплуатациóнника контролируемой зоны

1.
Název a evidenční číslo provozovatele kontrolovaného pásma:
Name and registration number of controlled area operator
Название и регистрационный № эксплуатациóнника контролируемой зоны

……………………………………………………………………………

……………………………………………………………………………

Název pracoviště provozovatele kontrolovaného pásma [5)]:
Name of workplace:
Название рабочево места

……………………………………………………………………………

Začátek práce ……………… Ukončení práce……………..
Beginning of work *End of work*
Начало работы Конец работы

Razítko a podpis
Stamp and signature
Печать и подпись

Období [6)] *Period* Период	**$H_P(10)$ [6)]**	**E_{50}**	**E**	**$H_{T1*)}$**	**$H_{T2*)}$**

2.
Název a evidenční číslo provozovatele kontrolovaného pásma:

……………………………………………………………………………

……………………………………………………………………………

Název pracoviště provozovatele kontrolovaného pásma:

……………………………………………………………………………

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Registrační číslo:
Registration No.:
№ регистрации:

Začátek práce ……………… Ukončení práce……………..

Razítko a podpis

Období [6)]	**$H_P(10)$** [6)]	**E_{50}**	**E**	**H_{T1}**	**H_{T2}**

3.
Název a evidenční číslo provozovatele kontrolovaného pásma:

…………………………………………………………………………

…………………………………………………………………………

Název pracoviště provozovatele kontrolovaného pásma:
…………………………………………………………………………

Začátek práce ……………… Ukončení práce……………..

Razítko a podpis

Období [6)]	**$H_P(10)$** [6)]	**E_{50}**	**E**	**H_{T1}**	**H_{T2}**

4) vyplní dohlížející osoba
is filled by a radiation protection officer
заполняет работник надзора

5) je nutno uvést pracoviště provozovatele, ke kterému jsou vztaženy výsledky monitorování
it is necessary to specify workplace of operator, to which the results of monitoring are related
нужно огласить рабочее место эксплуатациónника к которому относятсья результаты монитиривания

6) uvedené období může být maximálně jednoměsíční,
the monitoring period can be one month in maximum,
указанный период может длиться максимум один месяц

[o)] uveďte tuto značku, pokud je zaznamenán předběžný výsledek pracovníka pomocí operativního dozimetru, výsledek legálního dozimetru musí být neprodleně po vyhodnocení zaslán osobě povinné zajistit radiační ochranu externího pracovníka
use this symbol for preliminary result of operational dosimetry, the result of legal dosimetry should be send to the responsible person immediately after the evaluation
этот символ используйте, если для работника приведены предварительные данные, полученные с помощью оперативного дозиметра, результат легального дозиметра должен быть незамедлительно после обработки отправлен лицу которое должно обеспечить радиационную безопасность заочного сотрудника

*) specifikujte orgán nebo tkáň, pro které je ekvivalentní dávka stanovena
specifity the organ or tissue, for that the equivalent dose is evaluated
определите орган или ткань для которой была установлена эквивалентная доза

Annex 16 to Decree No. 422/2016 Coll.

Information on a source of ionising radiation sent to the Office by the holder of a permit for handling a source of ionising radiation and by the registrant

The holder of a permit to handle a source of ionising radiation must send the Office the following information about the source of ionising radiation for the list of sources:

- 1.1. the reference number of the holder of a permit to handle the source of ionising radiation;
- 1.2. information on the owner of the source of ionising radiation, if different from the holder of the permit to handle the source of ionising radiation, as follows:
  - 1.2.1. its name, in the case of a legal entity, or name and surname, in the case of a natural person;
  - 1.2.2. ID number, if assigned, or date of birth, in the case of a private individual; and
  - 1.2.3. registered address, in the case of a legal entity, or residential address, in the case of a natural person;
- 1.3. in the event of the transfer of a source of ionising radiation, information regarding the person to whom it was transferred, as follows:
  - 1.3.1. its name, in the case of a legal entity, or name and surname, in the case of a natural person;
  - 1.3.2. ID number, if assigned, or date of birth, in the case of a private individual;
  - 1.3.3. registered address, in the case of a legal entity, or residential address, in the case of a natural person; and
  - 1.3.4. the transfer date;
- 1.4. the name and address of the workplace where the source of ionising radiation is situated;
- 1.5. the category of the source of ionising radiation (insignificant, minor, simple, significant, very significant);
- 1.6. area of application (industry, medicine, veterinary medicine, education, research, military, other);
- 1.7. the category of the source of ionising radiation (insignificant, minor, simple, significant, very significant);
- 1.8. status (actively used in the Czech Republic, outside the Czech Republic, in a warehouse, awaiting disposal, servicing, long-term repairs, unspecified);
- 1.9. technical adaptation;
- 1.10. type-approval information (yes/no, document type and its number);
- 1.11. information on the manufacturer;
- 1.12. date of manufacture and serial number;
- 1.13. acceptance test date and acceptance certificate number;
- 1.14. start date for the handling of the source of ionizing radiation; and
- 1.15. the date until which this information is valid;

2. in the case of a radiation generator, also
   - 2.1. the type (especially X-ray, accelerator);
   - 2.2. fixation (stationary, mobile, portable);
   - 2.3. type name;
   - 2.4. parts information;

2.5. disposal (returned for disposal outside the Czech Republic, destroyed (disposal), unregulated destruction, export outside the Czech Republic or distribution in another Member State of the European Union); and
2.6. the date of disposal;
3. in the case of a sealed radionuclide source, also
3.1. the type catalogue code;
3.2. certificate number of the sealed radionuclide source and its date of issue;
3.3. the date of receipt of the sealed radionuclide source;
3.4. the radionuclide's specifications and its activity, and the date on which the activity was established;
3.5. resistance to external effects;
3.6. recommended duration of use;
3.7. disposal method (consumption, decrease in activity under the limit, permanent storage, conversion into another source of ionising radiation (reconstruction), returned for disposal outside the Czech Republic, destroyed (disposal), unregulated destruction, export outside the Czech Republic or distribution in another Member State of the European Union); and
3.8. the date of disposal;
4. in the case of equipment with a sealed radionuclide source, also
4.1. fixation (stationary, mobile, portable);
4.2. type name;
4.3. the total number of sealed radionuclide sources;
4.4. parts information;
4.5. disposal method (returned for disposal outside the Czech Republic, destroyed (disposal), unregulated destruction, export outside the Czech Republic or distribution in another Member State of the European Union);
4.6. the date of disposal; and
4.7. information on sealed radionuclide sources in devices to the extent defined under to point 3.

A registrant must send the Office the following information about the source of ionising radiation for the list of sources:
1.1. information about the owner of the source of ionising radiation, in the event that the registrant is not the owner; as follows:
1.1.1. its name, in the case of a legal entity, or name and surname, in the case of a natural person;
1.1.2. ID number, if assigned, or date of birth, in the case of a private individual; and
1.1.3. registered address, in the case of a legal entity, or residential address, in the case of a natural person;
1.2. the name and address of the workplace where it is situated, if different from the registrant's registered address or place of residence;
1.3. area of application (industry, medicine, veterinary medicine, education, research, military, other);
1.4. technical adaptation (dental intraoral x-ray devices, dental panoramic x-ray equipment, dental computed tomography, veterinary radiographic or fluoroscopic equipment, veterinary computed tomography, bone density meter);

1.5. fixation (stationary, mobile, portable);
1.6. type name;
1.7. type approval information (yes/no, document type and its number);
1.8. the manufacturer’s name,
1.9. year of manufacture and serial number;
1.10. status (actively used in the Czech Republic, outside the Czech Republic, in a warehouse, awaiting disposal, servicing, long-term repairs, unspecified);
1.11. date of acceptance test or last long-term stability test and the test certificate number;
1.12. start date for the handling of the source of ionising radiation;
1.13. in the case of disposal of the source of ionising radiation, its date; and
1.14. in the case of the transfer of a source of ionising radiation, information regarding the person to whom it was transferred, as follows:
   1.14.1. its name, in the case of a legal entity, or name and surname, in the case of a natural person;
   1.14.2. ID number, if assigned, or date of birth, in the case of a private individual;
   1.14.3. registered address, in the case of a legal entity, or residential address, in the case of a natural person; and
   1.14.4. the date of transfer of the source of ionising radiation.

Annex 17 to Decree No. 422/2016 Coll.

An overview of manufactured, imported, distributed, or exported sources of ionising radiation sources that is sent to the Office

The holder of a permit to manufacture, import, distribute, and export of sources of ionising radiation must send the Office the following information on manufactured, imported, distributed, and exported sources of ionising radiation:

1. information on the person to whom the source of ionizing radiation was transferred, as follows:
    - 1.1.1. its name, in the case of a legal entity, or name and surname, in the case of a natural person;
    - 1.1.2. ID number, if assigned, or date of birth, in the case of a private individual; and
    - 1.1.3. registered address, in the case of a legal entity, or residential address, in the case of a natural person;
2. the transfer date;
3. in the case of equipment with a sealed radionuclide source transferred without this source:
    - 3.1. type name;
    - 3.2. type approval information (yes/no, document type and its number); and
    - 3.3. serial number;
4. in the case of equipment with a sealed radionuclide source transferred with this source:
    - 4.1. type name;
    - 4.2. type approval information (yes/no, document type and its number);
    - 4.3. serial number;
    - 4.4. the radionuclide's specifications;
    - 4.5. the serial number of the sealed radionuclide source;
    - 4.6. the certificate number of the sealed radionuclide source and its date of issue; and
    - 4.7. the radionuclide's activity and the date on which it was established;
5. in the case of a sealed radionuclide source transferred separately:
    - 5.1. serial number;
    - 5.2. the radionuclide's specifications;
    - 5.3. the certificate number of the sealed radionuclide source and its date of issue; and
    - 5.4. the radionuclide's activity and the date on which it was established; and
6. in the case of an open radionuclide source:
    - 6.1. the radionuclide's specifications;
    - 6.2. the radionuclide's activity and the date on which it was established; and
    - 6.3. information on the quantity of the radionuclide.

A registrant must send the Office the following information on imported, exported, and distributed generators of radiation:

1. information on an imported, exported, and distributed generator of radiation:
    - 1.1. type name and manufacturer;
    - 1.2. type approval information (document type and its number);
    - 1.3. serial number;

1.4. information on the person to whom it was transferred, as follows:
   1.4.1. its name, in the case of a legal entity, or name and surname, in the case of a natural person;
   1.4.2. ID number, if assigned, or date of birth, in the case of a private individual; and
   1.4.3. registered address, in the case of a legal entity, or residential address, in the case of a natural person; and
1.5. the transfer date.

Annex 18 to Decree No. 422/2016 Coll.

Surface activity values for surface contamination

Contamination location	Radionuclide source type	Surface activity [Bq/cm^2]
The surface of floors, walls, ceilings, furniture, equipment, etc. in the monitored area of the workplace The outer surface of personal protective aids	A radionuclide source emitting beta or gamma radiation, and a low toxicity radionuclide source emitting alpha radiation	4
	Another radioactive source emitting alpha radiation	0.4
The inner surface of personal protective aids Workplace surfaces outside the monitored zone	A radionuclide source emitting beta or gamma radiation, and a low-toxicity radionuclide source emitting alpha radiation	0.4
	Another radioactive source emitting alpha radiation	0.04

Legend:

A low-toxicity radionuclide source emitting alpha radiation is
1. natural uranium, depleted uranium, natural thorium, Th-228, Th-230, Th-232, U-235, and U-238 is contained in ores or chemical concentrates;
2. radioactive source emitting alpha radiation with a half-life of less than ten days.

Surface activity values apply only to unfixed contamination, if surface contamination on floors, walls, ceilings, furniture and other equipment in the monitored zone of the workplace occurred as a result of the expected ways of using sources of ionising radiation.

Annex 19 to Decree No. 422/2016 Coll.

The contents of documentation for authorised activities within the scope of exposure situations

1. Documentation for evaluation of the properties of a source of ionising radiation must contain:
    1.1. in the case of proof of ability to measure and verify properties of a source of ionising radiation:
        1.1.1. stipulation of a natural person managing the acceptance test and the long-term stability test and proof of their special professional competence;
        1.1.2. proof of special professional competence of the natural person performing the acceptance test and the long-term stability test;
        1.1.3. specifications and acquisition method for measuring aids and measuring instruments used in tests that are not the property of the permit holder;
    1.2. in the case of methodologies, procedures, and sample measurement records:
        1.2.1. the acceptance test and long-term stability test:
            1.2.1.1. identification of the holder of the permit for assessment of the properties of the ionising radiation source;
            1.2.1.2. the name(s) and surname of the person who drew up the document;
            1.2.1.3. the date of the document's creation;
            1.2.1.4. the type of test for which the document has been drawn up;
            1.2.1.5. the kind and type of source of ionising radiation for which the document has been drawn up, and a description of its routine use;
            1.2.1.6. a list of documentation for the source of ionizing radiation required to perform the test, as follows:
                1.2.1.6.1. records of acceptance tests, of the previous long-term stability test, and of constancy tests;
                1.2.1.6.2. servicing and defect records;
                1.2.1.6.3. a user manual;
            1.2.1.7. in the case of radiodiagnostics and interventional radiology, the procedure for calibration and tests of the constancy of the operating meter, if they are to be performed as part of the acceptance test or long-term stability test;
            1.2.1.8. the procedure in the event that one of the tests detects a borderline result, an atypical result, or non-conformity with tolerances or recommended values;
            1.2.1.9. information on tests of accessories that have an impact on radiation protection, in particular
                1.2.1.9.1. if radiotherapy, the treatment planning system ;
                1.2.1.9.2. if radiotherapy, the record and verify system;
                1.2.1.9.3. the primary pair of diagnostic monitors for mammography X-ray equipment with image digitisation;
                1.2.1.9.4. protective aids for x-ray equipment used in veterinary medicine;
            1.2.1.10. clear specification of specialised concepts, quantities, units, or abbreviations used in the methodology or sample record in the event that their ambiguous interpretation is possible;
            1.2.1.11. methodologies for individual tests that include
                1.2.1.11.1. the characteristics of the measured parameter;
                1.2.1.11.2. the type of measuring instrument and aids;

1.2.1.11.3. the measurement procedure and method of obtaining measurement results, in particular the description of the measurement, measurement set-up geometry, irradiator configuration, quantities and units used, and how they are interpreted;
1.2.1.11.4. calculations, algorithms, and how they are interpreted;
1.2.1.11.5. a description of how benchmarks that are compared with measured values are stipulated;
1.2.1.11.6. for the tests referred to in § 26(2(c)(2), § 26(2)(d)(4) and (5), § 26(2)(e)(4), § 28(1)(b)(4) and (5), and § 28(1)(c)(4), stipulation of measurement uncertainties;
1.2.1.11.7. tolerances of measured parameters;
1.2.1.11.8. how final evaluation of a given test is performed;
1.2.2. in the case of a sample acceptance test record and long-term stability test record:
1.2.2.1. identification of the permit holder who performed the test;
1.2.2.2. the test record number;
1.2.2.3. indication of whether it is an acceptance test, a test of long-term stability, or a partial test of long-term stability, and why it was performed;
1.2.2.4. identification of the natural person that performed the test, and the natural person that managed the test;
1.2.2.5. for radiotherapy, identification and position of the individual who represented the operator of the source of ionising radiation during the test;
1.2.2.6. the date and time of the beginning and end of the test;
1.2.2.7. the date by which another periodic long-term stability test must be performed on the source of ionising radiation;
1.2.2.8. the type, modality and method of use of the tested source of ionising radiation, including the kind of image receptor used;
1.2.2.9. identification of the licensee or registrant using the source of ionizing radiation;
1.2.2.10. information about the location of sources of ionising radiation;
1.2.2.11. identification of the tested source of ionising radiation, including:
1.2.2.11.1. the model and serial number of the source of ionising radiation;
1.2.2.11.2. the model and serial number of equipment with a sealed radionuclide source;
1.2.2.11.3. the model and serial number of a sealed radionuclide source;
1.2.2.11.4. the model and serial number of a radiation generator;
1.2.2.11.5. the model and serial number of an X-ray tube and its cover;
1.2.2.11.6. the model and serial number of an image receptor that is a fixed part of a radiodiagnostic, interventional or veterinary source of ionising radiation;
1.2.2.11.7. the year of manufacture of the source of ionising radiation;
1.2.2.11.8. specification of the focal length and filtration of radiodiagnostic, interventional or veterinary sources of ionising radiation;
1.2.2.11.9. specification of other important parts of sources of ionising radiation, including the modalities and auxiliary systems in radiotherapy;
1.2.2.11.10. specification of the radionuclide contained in a sealed radionuclide source, including its activity;

1.2.2.12. the record number of the previous test of long-term stability or acceptance test, and if it was performed by another permit holder, the identification of the permit holder who performed it;
1.2.2.13. information about the used image receptor in radiodiagnostics, interventional radiology and veterinary x-ray imagining:
1.2.2.13.1. DDR,
1.2.2.13.2. CR, or
1.2.2.13.3. film-screen process,
1.2.2.14. information whether a source of ionizing radiation is used in radiodiagnostic medicine, interventional radiology or veterinary imaging features the following:
1.2.2.14.1. automatic exposure;
1.2.2.14.2. tomography;
1.2.2.14.3. digital subtraction angiography;
1.2.2.14.4. a cephalostat;
1.2.2.15. information whether
1.2.2.15.1. mammography X-ray equipment is used to perform mammography screening;
1.2.2.15.2. mammography X-ray equipment enables stereotaxy or mammographic tomosynthesis,
1.2.2.15.3. is radiographic or fluoroscopic X-ray equipment or computed tomography equipment used in radiotherapy, including details of this use; and
1.2.2.15.4. computed tomography equipment used in radiodiagnostic medicine or interventional radiology allows fluoroscopic imaging mode;
1.2.2.16. information whether the source of ionizing radiation is
1.2.2.16.1. stationary,
1.2.2.16.2. mobile, or
1.2.2.16.3. portable,
1.2.2.17. in radiodiagnostic medicine, interventional radiology, and in veterinary imaging, identification of accessories to sources of ionising radiation that have an impact on radiation protection, especially
1.2.2.17.1. examination tools used;
1.2.2.17.2. automatic developing equipment or indirect digitisation reader;
1.2.2.17.3. cassettes, indirect digitisation films, X-ray films, and amplification films used, including their sensitivity and information whether this involves a green or blue programme or high-speed film; and
1.2.2.17.4. a diagnostic monitor that was checked during testing or used to assess tests;
1.2.2.18. in radiotherapy, identification of accessories to sources of ionising radiation that have an impact on radiation protection, especially
1.2.2.18.1. a treatment planning system, record and verifysystem; and
1.2.2.18.2. a system for transmitting data from the source of ionising radiation to the treatment planning system and to the record and verify system;
1.2.2.19. in methods of using a source of ionising radiation other than as defined under points 1.2.2.16 and 1.2.2.17, identification of accessories to sources of

ionising radiation that have an impact on radiation protection, especially sealed radionuclide source applicators used;

1.2.2.20. assessment of the presence of documentation for the source of ionizing radiation required to perform the test in the workplace, including the decision about the type approval in the case of acceptance test performed on a source of ionising radiation subject to type approval;

1.2.2.21. information on

1.2.2.21.1. technical changes that occurred within a source of ionising radiation and its accessories that have an impact on radiation protection since the last test, and that could affect the performance of the test;

1.2.2.21.2. restrictions on the scope of the test and the justification;

1.2.2.21.3. a change to test procedures that occurred during the test, including its justification; and

1.2.2.21.4. operating conditions affecting the test being performed;

1.2.2.22. information on instruments and aids used, including the date of the last verification of specified measuring instruments;

1.2.2.23. assessment whether a source of ionising radiation that is used for the medical irradiation or the workplace where it is used meets the requirements of § 75 to 78;

1.2.2.24. a record of the calibration or constancy testing of a working measuring instrument, if performed as part of the test;

1.2.2.25. records of tests performed as part of the testing, including records of tests performed during testing beyond the scope of the methodology, containing

1.2.2.25.1. the number and name of the test that matches the common sample test record;

1.2.2.25.2. information on the conditions of measurement that affect the tested parameters;

1.2.2.25.3. the list of measured values and resultant parameters, including calibration coefficients and correction factors used;

1.2.2.25.4. measurement uncertainties, if their specification is required;

1.2.2.25.5. assessment of test results;

1.2.2.25.6. tolerances and recommended values for verified parameters;

1.2.2.25.7. in the event of failure to meet tolerances or recommended values of verified parameters, or in the event of borderline results, comments describing this failure or borderline results, including recommendation of a solution; and

1.2.2.25.8. in the event of divergence from the methodology, a record and detailed description of the divergence and its justification;

1.2.2.26. a summary overview of the results of individual tests, containing:

1.2.2.26.1. a table with the numbers and names of tests performed along with their evaluation;

1.2.2.26.2. comments regarding tests where a defect, a borderline or atypical result, or conflict with recommendations was found;

1.2.2.26.3. deadlines for elimination of less serious defects;

1.2.2.26.4. specification of very serious defects, with a warning that due to this very serious malfunction, the source of ionising radiation may not be used until said malfunction has been demonstrably eliminated;

1.2.2.26.5. for radiographic X-ray devices used for medical irradiation, specification whether the device is suitable for imaging children up to 3 years of age; and

1.2.2.26.6. in the case of a sealed radionuclide source and equipment with a sealed radionuclide source, a description of visible damage to the source, particularly cracks, notches, corrosion, or abrasion;

1.2.2.27. in the case of an acceptance test or long-term stability test that has shown the current scope or frequency of operating constancy to be insufficient, the proposed scope and frequency of operating constancy tests;

1.2.2.28. the proposed scope of long-term stability tests in the case of acceptance testing of a source of ionising radiation not used in radiodiagnostics, interventional radiology, and in veterinary imaging;

1.2.2.29. in the case of an acceptance test or long-term stability test performed after servicing that could have an effect on stray radiation, or after significant changes to routine operation that could affect personal dosages of radiation workers or the population, a record of measurement of stray radiation in the vicinity of the source of ionising radiation, which contains:

1.2.2.29.1. readings in work sites in the vicinity of sources of ionising radiation;

1.2.2.29.2. readings behind shielding that prove shielding efficacy;

1.2.2.29.3. exposure parameters used and positions of the source of ionising radiation during measurement that correspond to routinely used exposure parameters;

1.2.2.29.4. estimates of the number and durations of exposures for one calendar year;

1.2.2.29.5. estimates of dose quantities at measured workplaces and behind shielding for one calendar year, calculated from data pursuant to points 1.2.2.28.1 to 1.2.2.28.4;

1.2.2.29.6. a description and diagram of the vicinity of the source of ionising radiation, including a description of shielding and distances of measurement points from the source of ionising radiation and from the floor; and

1.2.2.29.7. in the case of a portable veterinary and industrial source of ionising radiation, information on how far from the source of ionising radiation warning tape should be located during routine imaging;

1.2.2.30. if a defect is eliminated prior to the issue of the test record:

1.2.2.30.1. results of the measurements made on the equipment prior to the elimination of the defect;

1.2.2.30.2. a description of measures implemented after the fault was detected and how it was eliminated; and

1.2.2.30.3. measurement results after elimination of the fault;

1.3. in the case of an overview of equipment and arrangements for carrying out the proposed services:

1.3.1. a list of measuring instruments used during tests, including type and serial number; and
1.3.2. a list of aids used during tests;
1.4. in the case of a plan to ensure measurement of quantities:
1.4.1. identification information for items on the list pursuant to point 1.3 that are specified measuring instruments, and a plan for their metrological provisioning; and
1.4.2. identification information for items on the list pursuant to point 1.3 that are operating measuring instruments, and a plan for their metrological provisioning.
2. Documentation for the performance of services that are important from the perspective of radiation protection, specifically performance of personal dosimetry, must contain
2.1. in the case of methodologies and procedures:
2.1.1. a sample contract with customers, to whom the personal dosimetry service will be provided;
2.1.2. sample instructions for customers;
2.1.3. how and how often customers will be given personal monitoring results;
2.1.4. a sample of the document that will be used to give customers personal monitoring results;
2.1.5. how and how often the Office will be given personal monitoring results;
2.1.6. a description of the process of evaluating personal doses, including quantities that will be stipulated, how they are calculated, and their inaccuracies;
2.1.7. a description of the assessment method for eye lens exposure;
2.1.8. a description of the effective dose calculation method;
2.1.9. a description of the assessment of personal doses when protective aids are used, including calculation of evaluated quantities when multiple personal dosimeters are used;
2.1.10. a description of how the effect of known systematic inaccuracies is eliminated, including energy and directional dependencies;
2.1.11. a description of how a dosimeter irradiated in an abnormal manner is assessed; and
2.1.12. a description of how doses that exceed derived or personal limits are assessed;
2.2. in the case of an overview of equipment and arrangements for carrying out the proposed services:
2.2.1. a list of devices and aids used in performing the personal dosimetry services;
2.2.2. descriptions and drawings of personal dosimeters; and
2.2.3. conditions for the use of personal dosimeters;
2.3. in the case of a plan to ensure measurement of quantities:
2.3.1. items on the list under point 2.2 that are specified measuring instruments, and a plan for their metrological provisioning;
2.3.2. items on the list under point 2.2 that are operating measuring instruments, and a plan for their metrological provisioning;
2.3.3. a plan for metrological provisioning of the assessment process for personal dosimetry as a whole; and
2.3.4. a plan for participation in international or national comparative measurements in the area of personal dosimetry.
3. Documentation for the performance of services that are important from the perspective of radiation protection, specifically stipulation of personal doses of workers in the workplace,

with the possibility of increased radiation exposure from natural sources of radiation pursuant to § 93(1)(b) of the Atomic Act and in workplaces with possible increased exposure from radon pursuant to § 96(1) of the Atomic Act, must contain:

3.1. in the case of methodologies and procedures:

- 3.1.1. the methodology for measurement of radon activity concentration and the procedure for determining the effective dose due to the inhalation of radon and its decay products;
- 3.1.2. the methodology for measurement of spatial dose equivalent rate and procedures for stipulating personal doses due to external gamma irradiation;
- 3.1.3. the methodology for measurement and stipulation of the effective dose due to inhalation of natural radionuclides other than radon and its decay products;
- 3.1.4. the methodology for measurement and stipulation of personal doses due to exposure of the skin, eye lens, and limbs to a natural radionuclide;
- 3.1.5. how measurements are performed and results evaluated in relation to values specified in § 88(2);
- 3.1.6. how measurements are performed and results evaluated in relation to the value specified in § 93(1);
- 3.1.7. how repeat measurements are performed and results evaluated in relation to values specified in § 88(4)(b);
- 3.1.8. how measurements are performed and results evaluated in relation to the value specified in § 93(2);
- 3.1.9. how measurements are performed and results evaluated in relation to exposure limits specified in § 4;
- 3.1.10. personal monitoring procedures;
- 3.1.11. a description of instrumentation; and
- 3.1.12. description of the content of the record on measuring with purpose of establishing personal doses of worker, including
  - 3.1.12.1. number;
  - 3.1.12.2. identification of the permit holder;
  - 3.1.12.3. identification of the individual that performed the measurement;
  - 3.1.12.4. identification of who ordered the measurement;
  - 3.1.12.5. identification of the workplace operator;
  - 3.1.12.6. name and address of the workplace;
  - 3.1.12.7. workplace classification pursuant to § 93(1)(b) of the Atomic Act and § 91 or pursuant to § 96(1) of the Atomic Act;
  - 3.1.12.8. a description of the site and technologies used;
  - 3.1.12.9. the measurement methodology used and the purpose of the measurements;
  - 3.1.12.10. the date of the measurements;
  - 3.1.12.11. analysis of possible scenarios of increased exposure of workers to natural radiation sources;
  - 3.1.12.12. identification of workers in the workplace;
  - 3.1.12.13. justification of the scope of measurements with reference to the decree and the methodology used;
  - 3.1.12.14. a list of devices and aids used, for specified measuring instruments, their verification sheets and their expiry dates;
  - 3.1.12.15. information on measurement locations;

3.1.12.16. a description of measurement conditions;
3.1.12.17. measurement results;
3.1.12.18. assessment of measurement results;
3.1.12.19. a conclusion with proposed further steps;
3.1.12.20. the date the record was drawn up; and
3.1.12.21. the signature of an individual with appropriate professional qualification certificate who ensures fulfilment of duties during measurement, and of the permit holder performing the measurements if he is a natural person or the statutory body of the permit holder performing the measurements, if he is a legal person.

4. Documentation for the performance of services that are important from the perspective of radiation protection, specifically measurement and assessment of exposure to a natural source of radiation in a building for purposes pursuant to § 98 and § 99 of the Atomic Act, must contain:
4.1. in the case of methodologies and procedures:
4.1.1. methodologies for measuring the radon activity concentration in occupied and unoccupied buildings and under different exposure conditions, including
4.1.1.1. procedures for measuring radon activity concentration;
4.1.1.2. a description of exposure conditions for measurement in occupied and unoccupied buildings;
4.1.1.3. a description of the selection of measurement points;
4.1.1.4. a description of instrumentation; and
4.1.1.5. how measurement results are presented;
4.1.2. the methodology for measurement of spatial dose equivalent rate, including:
4.1.2.1. the measurement procedure;
4.1.2.2. a description of the selection of measurement points;
4.1.2.3. a description of instrumentation; and
4.1.2.4. how measurement results are presented;
4.1.3. the procedure for measuring temperature in the building;
4.1.4. a description of how measurement results are assessed for both occupied and unoccupied buildings and different exposure conditions in relation to reference levels specified in § 97(1) and (2); and
4.1.5. a description of the record of measurement and assessment of natural radiation in a building, including:
4.1.5.1. number;
4.1.5.2. identification of the permit holder;
4.1.5.3. identification of the individual that performed the measurement;
4.1.5.4. identification of who ordered the measurement;
4.1.5.5. the date of the measurements;
4.1.5.6. information on the measured building and its type;
4.1.5.7. a description of the building and its use at the time of measurement, including a site plan showing the measurement sites;
4.1.5.8. the measurement methodology used and the purpose of the measurements;
4.1.5.9. a description of the measuring conditions in the building, including its usage at the time of measurement and weather conditions at the time of measurement;

4.1.5.10. a list of devices and aids used, for specified measuring instruments, their verification sheets and their expiry dates;
4.1.5.11. measurement results;
4.1.5.12. assessment of measurement results;
4.1.5.13. a conclusion with proposed further steps;
4.1.5.14. the date the record was drawn up;
4.1.5.15. the signature of an individual with appropriate professional qualifications certificate who ensures fulfilment of duties during measurement, and the permit holder performing the measurements, if he is a natural person, or of the statutory body of the permit holder performing the measurements, if he is a legal person.

5. Documentation for the performance of services that are important from the perspective of radiation protection, specifically stipulation of the radon index for parcel of land for purposes pursuant to § 98 of the Atomic Act, must contain:
5.1. in the case of methodologies and procedures:
5.1.1. the methodology for determining the radon index of the parcel of land, including:
5.1.1.1. how to measure the activity concentration of radon in soil air;
5.1.1.2. how to sample soil air;
5.1.1.3. how to determine the gas permeability of soils;
5.1.1.4. how to use local indicators and the general characteristics of subsoil affecting the direction and rate of radon movement in foundation soil;
5.1.1.5. how to determine the radon index of a parcel of land;
5.1.1.6. a description of instrumentation; and
5.1.1.7. a description of the results assessment method pursuant to § 96(4);
5.1.2. a description of the content of the record on determining the radon index of a parcel of land, including
5.1.2.1. number;
5.1.2.2. identification of the permit holder;
5.1.2.3. identification of the individual that performed the measurement;
5.1.2.4. identification of who ordered the measurement;
5.1.2.5. identification of the measured land parcel including a map on which measured areas, sampling sites, and soil probes are shown;
5.1.2.6. identification of the future building for which the determination is taking place;
5.1.2.7. the date of the measurements;
5.1.2.8. the methodology used and the purpose of the measurements;
5.1.2.9. a description of the measurement conditions, layout of measuring points, their number and grid, weather conditions at the time of measurement, description of the land parcel, including a regional geological description and its geological characteristics, a list of buildings and other things present on the land parcel at the time of the measurement;
5.1.2.10. in the case of sampling of soil air, information on equipment used, the amount of air sampled, and the sampling depth;
5.1.2.11. a description of how to determine the gas permeability of soils;
5.1.2.12. a list of devices and aids used, for specified measuring instruments, their verification sheets and their expiry dates;

5.1.2.13. the results of measurements of radon activity concentration including statistical characteristics;
5.1.2.14. the determined gas permeability of soils;
5.1.2.15. the determined radon index of the land parcel;
5.1.2.16. a conclusion with information on further steps;
5.1.2.17. the date the record was drawn up; and
5.1.2.18. the signature of an individual with appropriate professional qualifications certificate who ensures fulfilment of duties during measurement, and the permit holder performing the measurements, if he is a natural person, or of the statutory body of the permit holder performing the measurements, if he is a legal person.

6. Documentation for the performance of services that are important from the perspective of radiation protection, specifically measurement and assessment of the content of natural radionuclides in construction material for purposes pursuant to § 101(2)(a) of the Atomic Act, must contain:
6.1. in the case of methodologies and procedures:
6.1.1. sampling and sample treatment;
6.1.2. the contents of the sampling record;
6.1.3. a description of sampling locations and frequency;
6.1.4. a description of instrumentation;
6.1.5. how to measure and process measurement results for specific activities of Ra-226, Th-228, and K-40, including measurement uncertainties and how to express measurement results;
6.1.6. how to calculate the specific activity index, including its uncertainties;
6.1.7. how the specific activity index result is assessed in relation to values specified in § 105(2) and (4); and
6.1.8. a description of the record of measurement and assessment of natural radionuclides in construction material, including:
6.1.8.1. number;
6.1.8.2. identification of the permit holder;
6.1.8.3. identification of who ordered the measurement;
6.1.8.4. identification of the construction material manufacturer or importer;
6.1.8.5. specification of the measurement methodology;
6.1.8.6. the sample number under which the sample is recorded in the measurement laboratory;
6.1.8.7. information on the sampled construction material;
6.1.8.8. the purpose of the sampled construction material;
6.1.8.9. the date of manufacture or import of the sampled construction material;
6.1.8.10. the sampling location;
6.1.8.11. the sampling date;
6.1.8.12. the sampling method;
6.1.8.13. identification of the individual that took the sample;
6.1.8.14. information regarding treatment of the sample for measurement outside the measurement laboratory;
6.1.8.15. a list of devices and aids used, for specified measuring instruments, their verification sheets and their expiry dates;

6.1.8.16. identification of the individual that performed the measurement;
6.1.8.17. the place and date of measurement;
6.1.8.18. measurement results;
6.1.8.19. assessment of measurement results;
6.1.8.20. if values specified in § 102(2) and (4) are exceeded, information regarding further steps;
6.1.8.21. the date the record was issued; and
6.1.8.22. the signature of an individual with appropriate professional qualifications certificate who ensures fulfilment of duties during measurement, and the permit holder performing the measurements, if he is a natural person, or of the statutory body of the permit holder performing the measurements, if he is a legal person.

7. Documentation for the performance of services that are important from the perspective of radiation protection, specifically measurement and assessment of the content of natural radionuclides in water for purposes pursuant to § 100(2)(a) of the Atomic Act, must contain:
7.1. in the case of methodologies and procedures:
7.1.1. sampling and sample treatment;
7.1.2. the contents of the sampling record;
7.1.3. a description of sampling locations and frequency;
7.1.4. a description of instrumentation;
7.1.5. how to measure and process measurement results, including measurement uncertainties and how to express measurement results for:
7.1.5.1. total alpha activity concentration;
7.1.5.2. total beta activity concentration;
7.1.5.3. radon activity concentration;
7.1.5.4. the activity concentrations of other natural radionuclides; and
7.1.5.5. the activity concentration of K-40;
7.1.6. the method of calculating the indicative dose, including uncertainties of its determination and expression of the result; and
7.1.7. how measurement results are evaluated in relation to values specified in § 98(1), (2), and (6);
7.2. a description of the record of measurement and assessment of natural radionuclides in water, including:
7.2.1. number;
7.2.2. identification of the permit holder;
7.2.3. identification of who ordered the measurement;
7.2.4. identification of the drinking water supplier and bottled water producer or importer;
7.2.5. identification of the water main;
7.2.6. the measurement methodology used and the purpose of the measurements;
7.2.7. the sample number under which the sample is recorded in the measurement laboratory;
7.2.8. information on the type of water, including information regarding the removal of natural radionuclides from the water;
7.2.9. the sampling location;
7.2.10. the sampling date;
7.2.11. the sampling method;

7.2.12. identification of the individual that took the sample;
7.2.13. information regarding treatment of the sample for measurement outside the measurement laboratory;
7.2.14. a list of devices and aids used, for specified measuring instruments, their verification sheets and their expiry dates;
7.2.15. identification of the individual that performed the measurement;
7.2.16. the place and date of measurement;
7.2.17. measurement results;
7.2.18. assessment of measurement results;
7.2.19. if values specified in § 98(1), (2), and (6) are exceeded, information regarding further steps;
7.2.20. the date the record was issued; and
7.2.21. the signature of an individual with appropriate professional qualifications certificate who ensures fulfilment of duties during measurement, and the permit holder performing the measurements, if he is a natural person, or of the statutory body of the permit holder performing the measurements, if he is a legal person.

8. Documentation for the performance of services that are important from the perspective of radiation protection, specifically measurement and assessment of radionuclide content in a radioactive substance released from a workplace with the possibility of increased exposure form a natural source of radiation for purposes pursuant to § 95(1)(b) of the Atomic Act, must contain:
8.1. in the case of methodologies and procedures:
8.1.1. sampling and sample treatment;
8.1.2. the contents of the sampling record;
8.1.3. a description of sampling locations and frequency;
8.1.4. a description of instrumentation;
8.1.5. a description of how to measure and process measurement results, including measurement uncertainties and how to express measurement results for:
8.1.5.1. total alpha activity concentration;
8.1.5.2. total beta activity concentration;
8.1.5.3. specific activity/activity concentration of natural radionuclides from the U-238 and Th-232 series; and
8.1.5.4. specific activity/activity concentration of K-40;
8.1.6. calculation models and methods for an effective dose caused by release of a radioactive substance; and
8.1.7. how to evaluate measurement results in relation to values specified in § 108(4) and § 95(3) of the Atomic Act;
8.2. a description of the record of measurement and assessment of the content of radionuclides in a substance released from a workplace with possible increased exposure from a natural source of radiation, including:
8.2.1. number;
8.2.2. identification of the permit holder;
8.2.3. identification of who ordered the measurement;
8.2.4. identification of the individual releasing the radioactive substance;
8.2.5. identification of the workplace form which the radioactive substance is being released;

8.2.6. the measurement methodology used and the purpose of the measurements;
8.2.7. the sample number under which the sample is recorded in the measurement laboratory;
8.2.8. identification of the sampled released radioactive substance;
8.2.9. how the sampled released radioactive substance is being released;
8.2.10. the sampling location;
8.2.11. the sampling date;
8.2.12. the sampling method;
8.2.13. identification of the individual that took the sample;
8.2.14. information regarding treatment of the sample for measurement outside the measurement laboratory;
8.2.15. a list of devices and aids used, for specified measuring instruments, their verification sheets and their expiry dates;
8.2.16. identification of the individual that performed the measurement;
8.2.17. the place and date of measurement;
8.2.18. measurement results;
8.2.19. assessment of measurement results;
8.2.20. a conclusion with proposed further steps;
8.2.21. the date the record was issued; and
8.2.22. the signature of an individual with appropriate professional qualifications certificate who ensures fulfilment of duties during measurement, and the permit holder performing the measurements, if he is a natural person, or of the statutory body of the permit holder performing the measurements, if he is a legal person.

Annex 20 to Decree No. 422/2016 Coll.

Procedures for ensuring radiation protection by a registrant when using a source of ionising radiation

1. General requirements
    - 1.1. The registrant must send the Office a copy of the record of
        - 1.1.1. the acceptance test of a newly acquired source of ionising radiation prior to commencing its use;
        - 1.1.2. a long-term stability test of a source of ionising radiation that has been placed back into operation after a long period of idleness, within 1 month of it being placed back into operation; and
        - 1.1.3. the acceptance test of a fixed source of ionising radiation that has been moved prior to commencing its re-use.
    - 1.2. Within one month, a registrant must:
        - 1.2.1. notify the Office of the model and serial number of a source of ionising radiation handed over for disposal, and furnish the Office with confirmation of disposal issued by the person that performed it;
        - 1.2.2. notify the Office of the model and serial number of a source of ionising radiation sold or otherwise transferred to another person; and
        - 1.2.3. notify the Office of the model and serial number of a source of ionising radiation that has been taken out of operation for the long term.
    - 1.3. During the acceptance test and long-term stability test, the registrant must ensure that the person securing the registrant's radiation protection
        - 1.3.1. cooperates with the person performing this test, especially in providing information on the source of ionising radiation and its accessories, its use, and on the results of operating constancy tests; and
        - 1.3.2. has taken receipt of information on test results from the person performing this test.
2. Requirements for the use of intra-oral dental x-ray equipment
    - 2.1. During imaging and routine operation, the registrant must:
        - 2.1.1. when setting exposure parameters, developing film, or editing a digital image, follow the instructions of the manufacturer and the person that performed
            - 2.1.1.1. the acceptance test, if a long-term stability test has not yet been performed on the equipment; or
            - 2.1.1.2. in cases not provided for under point 2.1.1.1, the most recent long-term stability test;
        - 2.1.2. make a record of every action that makes it possible to retroactively assess patient exposure; and
        - 2.1.3. keep the record pursuant to point 2.1.2 for ten years.
    - 2.2. A registrant must ensure optimisation of radiation protection of radiation workers and the population as follows:
        - 2.2.1. the distance of an individual performing the irradiation from the imaged patient must be greater than 2 m, or during imaging this individual must be behind a barrier equivalent to at least 15 cm of solid brick; and
        - 2.2.2. other individuals present in the room during imaging must be at least 5 m from the imaged patient, or must be behind a barrier equivalent to at least 15 cm of solid brick and simultaneously at least 2 m from the imaged patient.

- 2.3. A registrant may use portable intra-oral X-ray equipment
  - 2.3.1. only if it is a secondary device for use outside a permanent office; or
  - 2.3.2. if for serious reasons a different device cannot be used as the primary device.
- 2.4. A registrant must ensure that a portable intra-oral X-ray device is equipped with an image receptor holder corresponding to the type of device and image receptor used, which must be used during routine imaging.
- 2.5. If a discrepancy is found during the operating constancy test performed pursuant to Annex 13
  - 2.5.1. points 1.1, 1.2.1, or 1.3.1, the registrant must reconfigure standard exposure parameters so that the change in imaging is compensated for all exposures, and must continue to use these reconfigured exposure parameters during routine operation and during operating constancy tests, or, in the event that such reconfiguration is not possible, must arrange servicing to correct it;
  - 2.5.2. points 1.2.2 or 1.3.2, the registrant must clean the monitor used for clinical diagnosis;
  - 2.5.3. point 1.3.3, the registrant must stop using unsatisfactory indirect digitisation film; and
  - 2.5.4. point 3.1, the registrant must clean the negatoscope.

3. Requirements for the use of panoramic dental X-ray equipment and a dental computed tomography scanner
   - 3.1. During imaging and routine operation, the registrant must:
     - 3.1.1. follow the instructions of the manufacturer, exposure table, or pre-sets, or follow the instructions of the person who performed the long-term stability test or the acceptance test;
     - 3.1.2. make a record of every action that makes it possible to retroactively assess patient exposure; and
     - 3.1.3. keep the record defined under point 3.1.2 for 10 years.
   - 3.2. A registrant must ensure optimisation of radiation protection of radiation workers and the population as follows:
     - 3.2.1. during routine imaging, he or she must follow instructions regarding protection from stray radiation specified in the acceptance test record, including proposed structural modifications or the use of protective aids; and
     - 3.2.2. during imaging, he or she shall ensure that no one other than the imaged patient is in the room.
   - 3.3. If a discrepancy is found during the operating constancy test performed pursuant to Annex 13
     - 3.3.1. points 2.1.1, 2.2, 2.3.1, or 4.1, the registrant must arrange servicing;
     - 3.3.2. points 2.1.2, 2.3.2, or 4.2, the registrant must clean the monitor used for clinical diagnosis;
     - 3.3.3. point 2.3.3, the registrant must stop using unsatisfactory indirect digitisation film; and
     - 3.3.4. point 3, the registrant must clean the negatoscope.
4. Requirements for the use of veterinary X-ray equipment
   - 4.1. A registrant must ensure optimisation of radiation protection of radiation workers and the population as follows:

4.1.1. during routine imaging, he or she must follow instructions regarding protection from ionising radiation specified in the acceptance test record or the long-term stability test record, including proposed structural modifications or the use of protective aids; and

4.1.2. in the case of an individual assisting during imaging of an animal in a location close to the X-ray beam, with an individual performing imaging with a portable veterinary X-ray device, he or she shall ensure:

4.1.2.1. the use of a protective shielding apron and collar providing shielding equivalent to at least 0.25 mm of lead; and

4.1.2.2. if during exposure the hands of this individual are near the primary beam, also the use of protective shielding gloves equivalent to at least 0.25 mm Pb.

4.2. During imaging and routine operation, the registrant must:

4.2.1. use the source of ionising radiation according to the manufacturer's instructions;

4.2.2. if the animal must be held during the examination,

4.2.2.1. ensure that the individual holding the animal is over the age of 18 and is not a pregnant woman;

4.2.2.2. instruct the individual holding the animal regarding

4.2.2.2.1. possible risks of ionising radiation related to holding the animal; and

4.2.2.2.2. instruct them regarding the appropriate way to hold the animal with respect to the edge of the X-ray field and the results of stray radiation measurements;

4.2.2.3. ensure the correct use of protective aids;

4.2.2.4. ask for written consent from the person holding the animal; and

4.2.2.5. ensure that the size and position of the X-ray field is configured using a light field so that the hands of the individual holding the animal are not located within the primary beam;

4.2.3. keep records of individuals holding the animal during examination;

4.2.4. keep information pursuant to point 4.2.3 for five years;

4.2.5. ensure that only individuals whose presence is necessary during the examination are present in the examination room; and

4.2.6. ensure the X-ray beam is collimated so that the size of the X-ray field is as small as possible with regards to the required examination; the X-ray field must not be larger than the image receptor.

4.3. During a radiographic examination at a temporary workplace, a registrant must

4.3.1. preferentially use an area that is surrounded by natural barriers, especially a wall or fence;

4.3.2. if use of an area pursuant to point 4.3.1 is not possible and the examination is taking place outside, ensure that no individual is located in the area in the path of the primary beam during irradiation;

4.3.3. mark off the area where animals are imaged with a warning tape at the distance stipulated in the acceptance test record or the long-term stability test record;

4.3.4. ensure that only the individual assisting during imaging is present in the area where the examination is being performed, and that their presence is necessary during the examination;

4.3.5. ensure that an individual pursuant to point 4.3.4

4.3.5.1. is equipped with personal protective aids;

4.3.5.2. is over the age of 18;
4.3.5.3. is not a pregnant woman;
4.3.5.4. has been instructed of the possible risks of ionising radiation related to assistance during imaging of an animal; and
4.3.5.5. has provided written agreement to assist while imaging the animal;

4.3.6. place the image receptor in a holder so that it does not need to be held during exposure;

4.3.7. if it is not possible to proceed pursuant to point 4.3.6, use means to ensure that the hands of the individual holding the image receptor are not in the immediate vicinity of the primary beam; in this case, the registrant must ensure that the individual holding the image receptor uses protective gloves;

4.3.8. choose the direction of the primary beam so that it is absorbed by the terrain as soon as possible;

4.3.9. mark the size of the X-ray field with a light field, and if light conditions do not permit good visibility of the light field, employ means to ensure that the edges of the light field are precisely aimed;

4.3.10. set beam collimation and image receptor size so that the primary beam does not reach past its edge;

4.3.11. if possible, give the animal a sedative prior to examination; and

4.3.12. ensure that the individual performing imaging gives a clear, loud warning prior to irradiation to all potentially present individuals near the irradiation location that ionising radiation will be used.

4.4. If a discrepancy is found during the operating constancy test performed pursuant to Annex 13

4.4.1. point 5.1, the registrant must stop using an unsatisfactory protective aid; and

4.4.2. points 5.2, 5.3, or 5.4, the registrant must arrange servicing.

5. Requirements for the use of an X-ray bone densitometer

5.1. A registrant must

5.1.1. during imaging, follow the instructions of the manufacturer of the source of ionising radiation;

5.1.2. make a record of every action that makes it possible to retroactively assess patient exposure; and

5.1.3. keep the record pursuant to point 5.1.2 for 10 years.

5.2. If a discrepancy is found during the operating constancy test performed pursuant to Annex 13 point 6, the registrant must not use the source of ionising radiation for medical irradiation until the discrepancy is eliminated through servicing and its elimination is confirmed with a successful operating constancy test.

Annex 21 to Decree No. 422/2016 Coll.

REGISTRATION FORM - A1

If administrative fees are paid via fee stamps, paste here.	**A. For SONS use**[1)]

REQUEST FOR REGISTRATION OF USE OF A SOURCE OF IONISING RADIATION

B. Identification of the applicant

Name of the legal entity or name(s) and surname of the natural person:[2)]	ID number [3)]:
Residential address of the natural person or registered address of the legal entity:[2)]	
Mailing address:	
Name(s) and surname of persons that are the statutory body or a member of the statutory body of the legal entity:[2)]	

C. Specification of the source of ionising radiation in use [4)]

□ Dental X-ray equipment

□ Veterinary X-ray equipment

□ X-ray bone densitometer

D. Information necessary for obtaining an extract from the Criminal Records Register for a natural person or a person who is the statutory body or a member of the statutory body of a legal entity (if there are several persons who are a statutory body or members of a statutory body, provide their details on a separate attachment to the registration form)

Name(s) and surname:	Date of birth:
Maiden name:	Place of birth:
Birth number:	District:
Citizenship	Town:

E. Information on payment of fees - if paid by bank transfer

debited from account number	**credited to account number**	**Amount (CZK)**

Payment codes			
Variable	**special processing**	**constant**	**specific**
*			

* provide an ID number; if a natural person hasn't been assigned an ID number, provide the first 6 digits of their birth number

Date and applicant's signature

1) Do not fill in, for use of the State Office for Nuclear Safety
2) Cross out where inapplicable
3) If a natural person has not been assigned an ID number, fill in their birth number
4) Select the source of ionising radiation you are registering

Annexes to registration form A1

- Information on the source of ionising radiation
- Record from the acceptance test or most recent long-term stability test
- Confirmation that the person ensuring radiation protection for the registrant has undergone preparations
- Document on the appointment of a natural person ensuring radiation protection for the registrant and their written consent to the appointment
- Proof of professional competence of the natural person for the registered activity or proof of professional competence for the registered activity for at least one member of the statutory body, if the applicant is a legal entity

REGISTRATION FORM - A2

If the administrative fee is paid with a stamp, paste here.	**A. For SONS use**[1)]

REQUEST FOR REGISTRATION OF IMPORT, EXPORT, OR DISTRIBUTION OF A RADIATION GENERATOR

B. Identification of the applicant

Name of the legal entity or name(s) and surname of the natural person:[2)]	ID number [3)]:
Residential address of the natural person or registered address of the corporate entity:[2)]	
Mailing address:	
The name(s) and surname of persons that are the statutory body or a member of the statutory body of the legal entity:[2)]	

C. Specification OF THE registered activity [4)]

□ Import of a radiation generator

□ Export of a radiation generator

□ Distribution of a radiation generator

D. Information necessary for obtaining an extract from the Criminal Records Register for a natural person or a person who is the statutory body or a member of the statutory body of a legal entity (if there are several persons who are a statutory body or members of a statutory body, provide their details on a separate attachment to the registration form)

Name(s) and surname:	Date of birth:
Maiden name:	Place of birth:
Birth number:	District:
Citizenship	Town:

E. Information on payment of fees - if paid by bank transfer

debited from account number	**credited to account number**	**Amount (CZK)**

Payment codes			
Variable	**special processing**	**constant**	**specific**
*			

* provide an ID number; if a natural person hasn't been assigned an ID number, provide the first 6 digits of their birth number

____

Date and applicant's signature

1) Do not fill in, for use of the State Office for Nuclear Safety
2) Cross out where inapplicable
3) If a natural person has not been assigned an ID number, fill in their birth number
4) Select the activity you are registering for

Annex to registration form A2

- Proof of professional competence of a natural person for registered activity or, where the applicant is a legal person, proof of competence for registered activity of at least one member of a statutory body.

STATE OFFICE FOR NUCLEAR SAFETY

REGISTRATION FORM - B

Date:
Ref. No:
Processing department:
Authorised official:

CONFIRMATION OF REGISTRATION

The State Office for Nuclear Safety, as the administrative body competent pursuant to § 10 of Act No 263/2016, the Atomic, Act, confirms the registration of:

1. **the use of a source of ionising radiation, a radiation generator in the area of dental radiodiagnostics, in the field of veterinary medicine, and bone densitometers;**
2. **import of a radiation generator, export of a radiation generator, distribution of a radiation generator.**

for:

Name of the legal entity or name(s) and surname of the natural person:

Residential address of the natural person or registered address of the legal entity:

ID number/birth number:

for the State Office for Nuclear Safety:

Annex 22 to Decree No. 422/2016 Coll.

National diagnostic reference levels

National diagnostic reference levels for radiographic examinations of adults
for groups of standard patients, regardless of gender, with an average weight of 70 kg ± 5 kg, with the weight of individual patients within the range of 50 - 90 kg

Examination type	P_{KA} (mGy×cm^2)	K_e (mGy)
Skull, overview images PA	700	2.8
Skull, overview images LAT	550	2.2
Chest PA	220	0.3
Chest LAT	550	1.1
Cervical spine AP	290	1.7
Cervical spine LAT	280	1.3
Thoracic spine AP	1100	4.4
Thoracic spine LAT	1200	5.7
Lumbar spine AP	1700	6.2
Lumbar spine LAT	3100	12.0
Abdomen AP	2900	5.2
Pelvis AP	2000	4.5

Legend:

P_{KA}– product of kerma and surface area
K_e– initial surface kerma
PA– rear-front projection
LAT– side projection
AP– front-rear projection

National diagnostic reference levels for radiographic-fluoroscopic and fluoroscopic examinations of adults
for groups of standard patients, regardless of gender, with an average weight of 70 kg ± 5 kg, with the weight of individual patients within the range of 50 - 90 kg

Examination type	P_{KA} for the entire examination (Gy×cm^2)
Oesophagus	15
Stomach and duodenum	16
Large intestine	32
Passage through the digestive tract	12
Excretion urography	13

Legend:

P_{KA} – product of kerma and surface area

National diagnostic reference levels for adult examination in interventional radiology
for groups of standard patients, regardless of gender, with am average weight of 80 kg ± 5 kg, with the weight of individual patients within the range of 60 - 100 kg

Examination type	**P_{KA} for the entire examination ($Gy \times cm^2$)**
Coronography	49
PCI/PTCA	91

Legend:

P_{KA}– product of kerma and surface area
PCI - percutaneous coronary intervention
PTC - percutaneous transluminal coronary angioplasty

National diagnostic reference levels for examination of adults using computed tomography
for groups of standard patients, regardless of gender, with an average weight of 70 kg ± 5 kg, with the weight of individual patients within the range of 50 - 90 kg

Examination type	**C_{VOL} (mGy)**	**P_{KL} for the entire examination ($mGy \times cm$)**
Head	65	1100
Neck	21	500
Chest	15	500
Spine	32	550
Abdomen	19	750
Pelvis	25	860

Legend:

P_{KL}– product of kerma and length
C_{VOL}– volumetric kerma index for computed tomography

National diagnostic reference levels for mammography examinations
for groups of standard patients defined by thickness of the breast after compression in cranial-caudal projection listed in the first column of the table

Breast thickness after compression (mm)	**D_G for cranial–caudal projection (mGy)**
19 – 23	1.1
30 – 34	1.3
43 – 47	1.6
51 – 55	1.8
58 – 62	2.1
73 – 77	2.5
85 – 95	3.0

Legend:

D_G – average dose in the milk gland

National diagnostic reference levels for dental examinations of adults
for all adult patients

Examination type	K_i (mGy)	P_{KA} (mGy×cm^2)
Intraoral image of the maxillary molar	1.2	-
Simple panoramic image of the jaw	-	110

Legend:

K_i– incident kerma
P_{KA}– product of kerma and surface area

National diagnostic reference levels for diagnostic examination of adults in nuclear medicine
for adult patients, regardless of gender, with a weight of 70 kg ± 5 kg

Examination			Radio-nuclide	Substance, chemical form	Activity applied during one examination (MBq)
organ, system, illness	examination type, group				
bones	scintigraphy (whole-body, three-phase, SPECT[1)])		Tc-99m	Phosphates, phosphonates	800
bone marrow	scintigraphy (whole body, SPECT)		Tc-99m	nano-colloids	550
brain	scintigraphy	dynamic	Tc-99m	TcO_4, DTPA	600
		static, planar	Tc-99m	TcO_4, DTPA	600
		SPECT	Tc-99m	TcO_4, DTPA, HMPAO, ECD	800
		receptors	I-123	Iophlupan, IBZM	200
		glucose accumulation	F-18	FDG	400
	cisternography		In-111	DTPA	40
			Yb-169	EDTA	40
thyroid gland	accumulation test		I-131	iodide	0.5
	scintigraphy	planar	Tc-99m	TcO_4	200
			Tc-99m	MIBI, DMSA (V)	400
			I-123	iodide	20
			I-131	iodide	7*)
			Tl-201	chloride	80
		whole-body for thyroid cancer	Tc-99m	MIBI, DMSA (V)	800
			I-131	iodide	185
			Tl-201	chloride	100
parathyroid gland	scintigraphy	planar	Tc-99m	TcO4	200
			Tc-99m	MIBI	800
			Tl-201	chloride	80
lungs	scintigraphy ventilatory	planar	Tc-99m	aerosol, technegas	1000**)
			Kr-81m	gas	6000***)
	sScintigraphy perfusion	planar	Tc-99m	MAA, microspheres	200
		SPECT	Tc-99m	MAA, microspheres	3000
heart	myocardial perfusion	SPECT	Tc-99m	MIBI, tetrofosmin	900****) 1400*****)
		SPECT	Tl-201	chloride	110
		SPECT (re-injection)	Tl-201	chloride	40
	metabolic imagining PET[2)] (viability)		F-18	FDG	500
	radionuclide ventriculography		Tc-99m	erythrocytes	800
	first flow scintigraphy		Tc-99m	TcO_4, HSA	900
	adrenergic invervation		I-123	MIBG	400
lymphatic system	radionuclide lymphography		Tc-99m	nano-colloid	150
	detection of sentinel nodes		Tc-99m	nano-colloid	150

Examination			Radio-nuclide	Substance, chemical form	Activity applied during one examination (MBq)
organ, system, illness	examination type, group				
veins	radionuclide venography (one limb)		Tc-99m	MAA	200
			Tc-99m	DTPA	300
	radionuclide angiography		Tc-99m	erythrocytes, TcO_4, DTPA, HSA	800
	scintigraphic thrombosis detection		Tc-99m	platelets	500
blood	blood volume and components		Tc-99m	HSA	80
			I-131	HSA	6
			Cr-51	erythrocytes	6
	survival and local destruction of blood elements		Cr-51	erythrocytes, platelets	6
			In-111	platelets	10
	ferrokinetics		Fe-59	Fe (III) citrate	3
spleen	scintigraphy	planar	Tc-99m	altered erythrocytes	100
		SPECT	Tc-99m	altered erythrocytes	200
hepatobiliary system	scintigraphy	planar	Tc-99m	colloids	150
		SPECT	Tc-99m	colloids	300
		dynamic	Tc-99m	IDA derivatives	250
gastrointestinal tract	salivary gland scintigraphy		Tc-99m	TcO_4	100
	scintigraphic motility of the oesophagus		Tc-99m	colloids	70
	gastroesophageal reflux		Tc-99m	colloids	50
	gastric evacuation		Tc-99m	colloids	60
	scintigraphy of Meckel's diverticulum		Tc-99m	TcO_4	500
	gastrointestinal bleeding scintigraphy [2)]		Tc-99m	erythrocytes	700
	determining blood and protein losses in the GIT		Cr-51	erythrocytes	4
			I-125	HSA	6
			I-131	HSA	6
	Schilling test		Co-57	monocyanocobalamin	1
			Co-58	monocyanocobalamin	1
kidneys	simple renography		I-131	hippuran	1
	scintigraphy	planar	Tc-99m	DMSA (III), gluconate	150
		SPECT	Tc-99m	DMSA (III), gluconate	250
		dynamic	Tc-99m	DTPA, MAG3, EC	250
		with evaluation of perfusion	Tc-99m	DTPA, MAG3, EC	500
	stipulation of EPPL[4)], GFR[5)]		Tc-99m	MAG3, DTPA	20
			I-131	hippuran	0.5
			Cr-51	EDTA	3
urinary bladder	radionuclide cystography	direct	Tc-99m	TcO_4	50
		indirect	Tc-99m	MAG3	200
testes, scrotum	scintigraphy		Tc-99m	TcO_4	600
tumours	scintigraphy (planar, SPECT)		Tc-99m	MIBI, depreotide, antibodies	800
			In-111	antibodies, pentetreotide	190
			Ga-67	citrate	300
			Tl-201	chloride	100
			I-123	MIBG	400
			F-18	FDG	750
	scintimammography (planar, SPECT)		Tc-99m	MIBI, tetrofosmin, phosphonates	800
inflammation	scintigraphy (planar, SPECT)		Tc-99m	leukocytes, HIG	600
			Tc-99m	antibodies	800
			In-111	leukocytes	30
			Ga-67	citrate	150

Legend:

*) only before therapy I-131
**) activity in nebuliser; it is assumed that less than one tenth is deposited in the lungs

***) for one application
****) activity for one application during the two-days protocol
*****) summary value for a one-day protocol
1) SPECT single-photon emission computed tomography;
2) PET positron emission tomography
3) GIT gastrointestinal tract, digestive tract;
4) EPPL effective renal plasma flow;
5) GFR glomerular filtration.

Annex 23 to Decree No. 422/2016 Coll.

Criteria for categorising a radiological incident, procedures in case of occurrence, record archiving time, and reporting scope and deadlines

1.The criteria for categorisation of a non-repeated radiological incident relating to one patient

Category	The criteria for the classification of a radiological incident into the appropriate category		
	In radiotherapy	**In nuclear medicine**	**In interventional radiology and radiodiagnostic medicine**
</A>	An event in which the patient experiences or can be expected to have a serious clinical manifestation that can lead to permanent injury or premature death. An event for which one can assume increased late effects of ionising radiation associated with excessive exposure of healthy tissue. In the case of teletherapy and brachytherapy, this primarily involves cases where the total applied dose differs by more than 20 % of the prescribed total dose. In the case of stereotactic irradiation in radiation therapy, this mainly involves cases where the total applied dose differs by more than 10 % of the prescribed dose.		**CT:** • C_{VOL} > 10 Gy **Interventional radiology:** • Kerma at the patient's input reference point > 15 Gy • P_{KA} > 1 500 Gy×cm^2
B	An event in which the patient experiences or can be expected to have a serious clinical manifestation that is not life-threatening but increases the likelihood of an undesirable result, especially treatment complications or insufficient tumour control. In the case of teletherapy and brachytherapy, this primarily involves cases where the total applied dose differs by 10 - 20 % of the prescribed total dose. In the case of stereotactic irradiation in radiation therapy, this mainly involves cases where the total applied dose differs by 5 - 10 % of the prescribed dose.	**Treatment application of nuclear medicine:** Total applied activity differs by more than 100 % from the prescribed activity. **Diagnostic application of nuclear medicine:** The applied activity is more than 20 times the prescribed activity.	**CT:** • C_{VOL} > 3 Gy – if an eye is not in the primary beam • C_{VOL} > 0.5 Gy – if an eye is in the primary beam **Interventional radiology:** • Kerma at the patient's input reference point > 5 Gy • P_{KA} > 500 Gy×cm^2
C	**All other radiological incidents except for the above**, for which there is little likelihood of clinical expression. These are especially • erroneous treatment conditions, particularly a wedge or shielding, for one fraction; • the wrong side or localisation for one fraction; or • treatment without a written prescription or day record for one fraction.	**All other radiological incidents except for the above.**	**All other radiological incidents except for the above.** These are especially • wrong patient; • wrong examined area; or • repeat exposure.

Legend:

P_{KA}– product of kerma and surface area

C_{VOL}– volumetric kerma index for computed tomography

2.The criteria for categorisation of repeated radiological incidents relating to one patient

Reclassification	Medical irradiation modality	The number of repeated radiological incidents for one patient
From category C to category B	Radiation therapy	Once or more
	Nuclear medicine	
	Interventional radiology	
	Computed tomography	
	Fluoroscopy	
	Dental computed tomography	
	Other radiodiagnostics	Three times and more
From category B to category A	Radiation therapy	Once or more
	Nuclear medicine	
	Interventional radiology	
	Computed tomography	
	Fluoroscopy	
	Dental computed tomography	
	Other radiodiagnostics	Three times or more
From category C to category A	Radiation therapy	Twice or more
	Nuclear medicine	
	Interventional radiology	
	Computed tomography	
	Fluoroscopy	Three times or more
	Dental computed tomography	
	Other radiodiagnostics	Nine times or more

Legend:

In the event that radiological incidents repeatedly affect one patient, they are classified into a higher category according to the rules in the table.

3.The criteria for categorisation of repeated radiological incidents involving several patients

<table>
<tr><th>Reclassification</th><th>Medical irradiation modality</th><th>Number of patients affected*</th></tr>
<tr><td rowspan="11">From category C to category B</td><td>Brachytherapy</td><td>3 or more patients in one month</td></tr>
<tr><td>Stereotactic irradiation in radiotherapy</td><td></td></tr>
<tr><td>Teletheraphy</td><td rowspan="2">10 or more patients in one month</td></tr>
<tr><td>Treatment applications of nuclear medicine:</td></tr>
<tr><td>Diagnostic applications of nuclear medicine:</td><td>20 or more patients in one month</td></tr>
<tr><td>Interventional radiology</td><td rowspan="2">10 or more patients in one month</td></tr>
<tr><td>Computed tomography</td></tr>
<tr><td>Fluoroscopy</td><td>20 or more patients in one month</td></tr>
<tr><td>Dental computed tomography</td><td></td></tr>
<tr><td>Mammography</td><td>100 or more patients in one month</td></tr>
<tr><td>Other radiodiagnostics</td><td>200 or more patients in one month</td></tr>
<tr><td rowspan="10">From category B to category A</td><td>Brachytherap</td><td>3 or more patients in one month</td></tr>
<tr><td>Stereotactic irradiation in radiotherapy</td><td></td></tr>
<tr><td>Teletheraphy</td><td rowspan="2">10 or more patients in one month</td></tr>
<tr><td>Treatment applications of nuclear medicine:</td></tr>
<tr><td>Diagnostic applications of nuclear medicine:</td><td>20 or more patients in one month</td></tr>
<tr><td>Interventional radiology</td><td rowspan="2">10 or more patients in one month</td></tr>
<tr><td>Computed tomography</td></tr>
<tr><td>Fluoroscopy
Dental computed tomography</td><td>20 or more patients in one month</td></tr>
<tr><td>Mammography</td><td>100 or more patients in one month</td></tr>
<tr><td>Other radiodiagnostics</td><td>200 or more patients in one month</td></tr>
<tr><td rowspan="11">From category C to category A</td><td>Brachytherapy</td><td>6 or more patients in one month</td></tr>
<tr><td>Stereotactic irradiation in radiotherapy</td><td></td></tr>
<tr><td>Teletheraphy</td><td rowspan="2">20 or more patients in one month</td></tr>
<tr><td>Treatment applications of nuclear medicine:</td></tr>
<tr><td>Diagnostic applications of nuclear medicine:</td><td>100 or more patients in one month</td></tr>
<tr><td>Interventional radiology</td><td rowspan="2">20 or more patients in one month</td></tr>
<tr><td>Computed tomography</td></tr>
<tr><td>Fluoroscopy</td><td>100 or more patients in one month</td></tr>
<tr><td>Dental computed tomography</td><td></td></tr>
<tr><td>Mammography</td><td>500 or more patients in one month</td></tr>
<tr><td>Other radiodiagnostics</td><td>1 000 or more patients in one month</td></tr>
</table>

Legend:

If radiological incidents repeatedly affect multiple patients, they are classified into a higher category according to the rules in the table.

* The number of affected patients is the number of patients that the cause of the radiological incident has affected, i.e. the number of patients who have been erroneously irradiated due to one error or a set of errors.

4.Deadlines for reporting serious radiological incidents

1. The Office must be informed in the event of
   1.1. a category A radiological incident
      1.1.1. immediately upon discovering that a radiological incident has occurred, of all the facts known about it;
      1.1.2. immediately upon determining all other facts within the scope of the radiological incident's investigation, especially after determining the facts listed in Part 5, of the determined facts;
      1.1.3. immediately upon implementing all measures to mitigate the consequences of the radiological incident as much as possible, of the implemented measures;
      1.1.4. immediately upon implementing all measures to prevent the occurrence of a similar radiological incident in the future, of the implemented measures; and
      1.1.5. in full, pursuant to Part 5, within one month from discovering that a category A radiological incident has occurred in radiotherapy;
   1.2. a category B radiological incident
      1.2.1. in radiotherapy, in full, pursuant to Part 5 within one month from discovering that a category A radiological incident has occurred;
      1.2.2. in interventional radiology, in radio diagnostics, or in nuclear medicine, in full, pursuant to Part 5, within three months from discovering that a radiological incident has occurred.
2. If tissue reactions caused by erroneous irradiation may adversely affect the health of the patient, or if due to radiological incidents it is necessary to make a change in treatment procedure, the patient or his or her legal representative, the indicating doctor, and the application technician, must be informed in the event of
   2.1. a category A radiological incident
      2.1.1. immediately upon discovering that a radiological incident has occurred, of all the facts known about it;
      2.1.2. immediately upon determining all other facts listed in Part 5 within the scope of the radiological incident's investigation, of the determined facts;
      2.1.3. immediately upon implementing all measures to mitigate the consequences of the radiological incident as much as possible, of the implemented measures;
      2.1.4. immediately upon implementing all measures to prevent the occurrence of a similar radiological incident in the future, of the implemented measures; and
      2.1.5. in full, pursuant to Part 5, within one month from discovering that a category A radiological incident has occurred in radiotherapy;
   2.2. a category B radiological incident, in full, pursuant to Part 5 within three months of discovering that a radiological incident has occurred;

5.The scope of reporting serious radiological incidents

1. The Office must be informed to the following extent by the deadlines pursuant to Part 4:
   1.1. in the event of a category A radiological incident
      1.1.1. the date and time the radiological incident was discovered, and of its occurrence, if known;
      1.1.2. the nature, scope and severity of the radiological incident;
      1.1.3. the possible impact of the radiological incident;
      1.1.4. measures implemented to mitigate the consequences of the radiological incident as much as possible;
      1.1.5. other facts determined during the investigation of the radiological incident that affect its nature, scope, impact and severity;
      1.1.6. further steps planned in the investigation of radiological events; and
      1.1.7. measures implemented to prevent the occurrence of a similar radiological incident in the future;
   1.2. in the event of a category B radiological incident
      1.2.1. the date the radiological incident was discovered, and of its occurrence, if known;
      1.2.2. the nature, scope and severity of the radiological incident;
      1.2.3. the possible impact of the radiological incident;
      1.2.4. measures implemented to mitigate the consequences of the radiological incident as much as possible;
      1.2.5. other facts determined during the investigation of the radiological incident that affect its nature, scope, impact and severity; and
      1.2.6. measures implemented to prevent the occurrence of a similar radiological incident in the future.
2. The patient or his or her legal representative, the indicating doctor, and application technician must be informed by the deadlines pursuant to Part 4 to the following extent:
   2.1. in the event of a category A radiological incident
      2.1.1. the date and time the radiological incident was discovered, and of its occurrence, if known;
      2.1.2. the nature, scope and severity of the radiological incident;
      2.1.3. the possible impact of the radiological incident;
      2.1.4. measures implemented to mitigate the consequences of the radiological incident as much as possible;
      2.1.5. other facts determined during the investigation of the radiological incident that affect the patient's state of health and treatment; and
      2.1.6. further steps planned in the investigation of the radiological incident;
   2.2. in the event of a category B radiological incident
      2.2.1. the date the radiological incident was discovered, and of its occurrence, if known;
      2.2.2. the nature, scope and severity of the radiological incident;
      2.2.3. the possible impact of the radiological incident;
      2.2.4. measures implemented to mitigate the consequences of the radiological incident as much as possible; and
      2.2.5. other facts determined during the investigation of the radiological incident that affect the patient's state of health and treatment.

3. Summary information about a radiological incident in radiation therapy, regarding which, pursuant to Part 4 points 1.1.5, 1.2.1, 2.1.5, and 2.2, the Office is informed, and that the permit holder draws up and maintains pursuant to Part 7 points 1.1.6, 1.1.7, 1.4.5 a 1.4.6, must contain:
   3.1. the date and time the radiological incident occurred, its duration, and the date and time it was discovered;
   3.2. a description of the radiological incident, its scope, severity, and category;
   3.3. the causes of the radiological event and all other facts determined during the investigation of the radiological incident that affect its nature, scope, impact and severity;
   3.4. clinical manifestations due to the radiological incident;
   3.5. an estimate of the potential long-term consequences of the radiological incident;
   3.6. measures implemented to prevent clinical consequences of the radiological incident;
   3.7. immediate measures to prevent the radiological incident from reoccurring; and
   3.8. preventive systemic measures to prevent the radiological incident from reoccurring.

6.Content and the archiving period for records of radiological incidents and cases where a radiological incident could have occurred if its causes had not been discovered in time and eliminated

1. Records of radiological incidents and cases where a radiological incident could have occurred if its causes had not been discovered in time and eliminated must be archived
   1.1. for category A radiological incidents, for 30 years from the discovery of the radiological incident;
   1.2. for category B radiological incidents, for 10 years from the discovery of the radiological incident;
   1.3. for category C radiological incidents, for 10 years from the discovery of the radiological incident; and
   1.4. for cases where a radiological incident could have occurred if its causes had not been discovered in time and eliminated, for 5 years from their discovery.
2. These records must content all the information about the radiological incident or about the case where a radiological incident could have occurred if its causes had not been discovered in time and eliminated, that were found during the investigation and about all the taken measures.

7.Procedures in the event of a radiological incident or if a radiological incident could have occurred if its causes had not been discovered in time and eliminated

1. In radiotherapy it is necessary,
   1.1. during a category A or B radiological incident,
      1.1.1. to immediately commence dosimetric and clinical assessment of the incident;
      1.1.2. to implement measures to limit clinical consequences of the incident for the afflicted patient, especially interruption of treatment according to the original treatment plan and recalculation of the treatment plan and related activities,

including drawing up a new treatment plan, and simulation and verification of the plan if the original plan needs to be modified or planned entirely anew;

1.1.3. to implement immediate measures that should ensure radiation protection for other patients, including verification of whether the same radiological incident cause is not present in other cases;

1.1.4. within the scope of investigating the radiological incident, to appoint investigation groups, define and analyse the problem, and analyse the root causes, progress and consequences of the radiological incident;

1.1.5. to implement systemic preventive measures;

1.1.6. to draw up a summary of information on the radiological incident pursuant to Part 5 point 3 and send it to the Office within one month of discovering this incident; and

1.1.7. to archive the summary of information on the radiological incident pursuant to Part 5 point 3 for the duration specified in Part6 and in the patient's health records;

1.2. in the event of a category A radiological incident, if tissue reactions caused by erroneous irradiation may adversely affect the health of the patient, or if due to the radiological incidents it is necessary to make a change in treatment procedure, the patient or his or her legal representative, the application technician, and the indicating doctor must be informed within one month of discovery of the radiological incident to the extent specified in Part 5 point 2.1;

1.3. in the event of a category B radiological incident, if tissue reactions caused by erroneous irradiation can adversely affect the health of the patient, or if due to the radiological incidents it is necessary to make a change in treatment procedure, the patient or his or her legal representative, the application technician, and the indicating doctor must be informed within three months of discovery of the radiological incident to the extent specified in Part 5 point 2.2;

1.4. in the event of a category C radiological incident

1.4.1. within the scope of investigating the radiological incident, to appoint investigation groups, define and analyse the problem, and analyse the root causes, progress, and consequences of the radiological incident, and dosimetric and clinical assessment of the radiological incident;

1.4.2. to implement measures to limit the clinical consequences of the incident for the afflicted patient;

1.4.3. if needed, to modify the treatment plan;

1.4.4. to identify and implement systemic preventive measures;

1.4.5. to draw up a summary of information on the radiological incident pursuant to Part 5 point 3 and send it to the Office within one month of discovering this incident; and

1.4.6. to archive summary information on the radiological incident to the extent specified in Part 5 point 3;

1.5. in the event that a radiological incident could have occurred if its causes had not been discovered in time and eliminated,

1.5.1. immediately after discovering that a radiological incident could occur, to take all measures to prevent it;

1.5.2. to investigate and find the root causes and contributing factors;

1.5.3. to create and file a record of this case; and

1.5.4. to implement preventive measures to prevent the occurrence of similar cases in the future.

2. In nuclear medicine, interventional radiology and radiodiagnostic medicine, it is necessary
   2.1. in the event of a radiological incident, in a manner and with timing corresponding to the severity of the radiological incident and its possible consequences,
      2.1.1. immediately after discovering that a radiological incident occurred, to implement measures to prevent an increase in the undesirable dose received by the patient, as well as measures to prevent this radiological incident repeating in the case of a different patient;
      2.1.2. to subsequently collect all available data on the radiological incident;
      2.1.3. to take timely action to mitigate the impact of the radiological incident, where possible;
      2.1.4. to determine the causes of the radiological incident and to change procedures so that the incident cannot be repeated;
      2.1.5. to inform the Office, the patient or his or her legal representative, the application technician, and the indicating doctor of the radiological incident pursuant to Parts 4 and 5; and
      2.1.6. to archive records of the radiological incident, records of its investigation, and of implemented measures, pursuant to Part 6;
   2.2. in the event that a radiological incident could have occurred if its causes had not been discovered in time and eliminated,
      2.2.1. immediately after discovering that a radiological incident could occur, to take all measures to prevent it;
      2.2.2. to subsequently determine the reasons why the radiological incident almost occurred, to verify whether standard procedures ensure the prevention of such a radiological incident, and if not, to change these procedures so that the radiological incident cannot occur in the future;
      2.2.3. to archive all records of these cases, records of their investigation, and of implemented measures.

Annex 24 to Decree No. 422/2016 Coll.

Information on health services during which ionising radiation was used and that were reported by a health services provider, and paid for by a health insurance company, provided to the Office by the health insurance company

1. Information must be provided to the Office in the following format:
    1.1. delimited ASCII text;
    1.2. the field separator is a semicolon;
    1.3. text is surrounded by the " " symbol;
    1.4. the decimal symbol is the comma; and
    1.5. date in dd.mm.yyyy format.
2. Information must be provided to the Office in the following extent:
    2.1. in case of a file interface with a radiologic performance
        2.1.1. performance code according to a medical performance,
        2.1.2. professional code,
        2.1.3. diagnosis code,
        2.1.4. coded identification number of health Center,
        2.1.5. district of health Center location,
        2.1.6. patient´s sex,
        2.1.7. patient´s year of birth,
        2.1.8. patient´s month of birth,
    2.2. in case of a file interface with a radiopharmaceuticals
        2.2.1. drug code,
        2.2.2. professional code,
        2.2.3. coded identification number of health Center,
        2.2.4. district of health Center location,
        2.2.5. patient´s sex,
        2.2.6. patient´s year of birth,
        2.2.7. patient´s month of birth,
        2.2.8. unique patient´s identifier for all provided data made by health insurance company,
        2.2.9. date of radiopharmaceutical filing and
        2.2.10. amount of filed radiopharmaceutical.

Annex 25 to Decree No. 422/2016 Coll.

Conditions for classifying workplaces located on an underground or ground floor of a building as workplaces with potentially increased exposure to radon

A. Conditions for classifying workplaces located on an underground or ground floor of a building as workplaces with potentially increased exposure to radon are as follows:

1. the workplace is located on an underground or ground floor of the building, except for
   1.1. a building with construction permit issued after 28 February1991;
   1.2. a building situated in the landscape so that all its perimeter structures are separated from the subsoil by an air gap where air can circulate freely;
   1.3. workplaces or buildings in which anti-radon measures have been implemented, and their sufficient efficacy confirmed by measurement;
   1.4. a workplace that is a parking lot or garage; or
   1.5. a workplace with a sub-cellar under its entire floor plan and without direct contact with a basement floor;
2. for a person who performs an activity during which a workplace is operated with possible increased exposure to radon, a natural person performs the work; and
3. a workplace on a basement or ground floor of a building is located in a municipality where the likelihood of exceeding the reference level pursuant to § 93(1) is greater than 30 %.The following municipalities comply with this condition:

REGION	DISTRICT	MUNICIPALITY
THE CITYOF PRAGUE	PRAGUE:	KOLOVRATY, LYSOLAJE, ŠEBEROV
THE CENTRAL BOHEMIAN REGION	BENEŠOV	BENEŠOV, BÍLKOVICE, BUKOVANY, BYSTŘICE, ČAKOV, DIVIŠOV, HEŘMANIČKY, CHOTÝŠANY, KŘEČOVICE, LITICHOVICE, MARŠOVICE, MRAČ, NEVEKLOV, OLBRAMOVICE, OSTŘEDEK, POPOVICE, POSTUPICE, SMILKOV, STRANNÝ, STRUHAŘOV, STŘEZIMÍŘ, TEPLÝŠOVICE, TISEM, TOMICE, TŘEBEŠICE, VÁCLAVICE, VELIŠ, VOJKOV, VOTICE, VRCHOTOVY JANOVICE
	BEROUN	BYKOŠ, KONĚPRUSY, KORNO, LIBOMYŠL, MÁLKOV, MĚŇANY, SUCHOMASTY, TMAŇ
	KLADNO	JEMNÍKY, MALÉ PŘÍTOČNO, TŘEBICHOVICE
	KOLÍN	HRADEŠÍN, MASOJEDY, PŘIŠIMASY
	PRAGUE - EAST	BABICE, BŘEZÍ, KLECANY, LOUŇOVICE, ŠTÍHLICE, TEHOVEC, VYŽLOVKA
	PRAGUE - WEST	BOJANOVICE, BRATŘÍNOV, ČÍČOVICE, PETROV, SVRKYNĚ, ŠTĚCHOVICE, TRNOVÁ

	PŘÍBRAM	BEZDĚKOV POD TŘEMŠÍNEM, BOROTICE, ČÍM, DALEKÉ DUŠNÍKY, DOLNÍ HBITY, DRAHENICE, DRÁSOV, DUBENEC, DUBLOVICE, HÁJE, HLUBYNĚ, HORČÁPSKO, HŘIMĚŽDICE, HUDČICE, HVOŽĎANY, CHOTILSKO, CHRÁST, CHRAŠTICE, JABLONNÁ, JESENICE, KAMÝK NAD VLTAVOU, KLUČENICE, KŇOVICE, KORKYNĚ, KOSOVA HORA, KOUPĚ, KOZÁROVICE, KRÁSNÁ HORA NAD VLTAVOU, KŘEPENICE, LÁZ, LEŠETICE, LHOTA U PŘÍBRAMĚ, MALÁ HRAŠTICE, MILEŠOV, MODŘOVICE, NALŽOVICE, NARYSOV, NEČÍN, NEDRAHOVICE, NECHVALICE, NOVÁ VES POD PLEŠÍ, NOVÉ DVORY, OBORY, OBOŘIŠTĚ, OSEČANY, OSTROV, OUBĚNICE, PEČICE, PETROVICE, POČEPICE, PROSENICKÁ LHOTA, PŘÍBRAM, PŘÍČOVY, RADĚTICE, RADÍČ, ROŽMITÁL POD TŘEMŠÍNEM, RYBNÍKY, SEDLČANY, SEDLEC-PRČICE, SMOLOTELY, STARÁ HUŤ, STAROSEDLSKÝ HRÁDEK, SVATÝ JAN, ŠTĚTKOVICE, TĚCHAŘOVICE, TŘEBSKO, VELKÁ LEČICE, VĚŠÍN, VIŠŇOVÁ, VOLENICE, VRANČICE, VRANOVICE, VŠEVILY, VYSOKÝ CHLUMEC, ZALUŽANY, ZDUCHOVICE, ŽUPANOVICE
	RAKOVNÍK	VELKÁ CHMELIŠTNÁ
THE SOUTH BOHEMIAN REGION	ČESKÉ BUDĚJOVICE	HRADCE, SLAVČE, VITÍN, ŽÁR
	ČESKÝ KRUMLOV	BESEDNICE, POHORSKÁ VES, SOBĚNOV
	JINDŘICHŮV HRADEC	BEDNÁREC, ČESKÝ RUDOLEC, ČÍMĚŘ, HEŘMANEČ, HORNÍ NĚMČICE, KUNŽAK, LODHÉŘOV, STARÉ MĚSTO POD LANDŠTEJNEM, STRMILOV, STUDENÁ
	PÍSEK	ALBRECHTICE NAD VLTAVOU, BOUDY, BOŽETICE, BRANICE, CERHONICE, ČIMELICE, ČÍŽOVÁ, DOBEV, DRHOVLE, HOROSEDLY, HRAZANY, HREJKOVICE, CHYŠKY, JICKOVICE, KLUKY, KOSTELEC NAD VLTAVOU, KOVÁŘOV, KOŽLÍ, KRÁLOVA LHOTA, KUČEŘ, KVĚTOV, LETY, MILEVSKO, MIROTICE, MIROVICE, MINICE, MIŠOVICE, MYSLÍN, NERESTCE, NEVĚZICE, OKROUHLÁ, ORLÍK NAD VLTAVOU, OSEK, OSLOV, OSTROVEC, PASEKY, PROBULOV, PŘEBOROV, PŘEDOTICE, PŘEŠTĚNICE, RAKOVICE, SMETANOVA LHOTA, STEHLOVICE, TÁLÍN, VARVAŽOV, VLKSICE, VOJNÍKOV, VRÁŽ, VRCOVICE, ZBELÍTOV, ZHOŘ, ZVÍKOVSKÉ

		PODHRADÍ
	PRACHATICE	BOHUNICE, BOŠICE, BUŠANOVICE, LČOVICE, RADHOSTICE, STACHY, STOŽEC, STRÁŽNÝ, SVATÁ MAŘÍ, ŠUMAVSKÉ HOŠTICE, TVRZICE, ÚJEZDEC, VACOV, VRBICE, VIMPERK, VLACHOVO BŘEZÍ, ZÁLEZLY, ŽELNAVA
	STRAKONICE	BĚLČICE, BEZDĚDOVICE, BLATNÁ, BRATRONICE, BŘEZÍ, BUZICE, ČEČELOVICE, ČEPŘOVICE, ČESTICE, DOUBRAVICE, DRÁŽOV, DŘEŠÍN, HAJANY, HÁJEK, HLUPÍN, HORNOSÍN, HOSLOVICE, CHOBOT, CHLUM, CHRÁŠŤOVICE, JINÍN, KADOV, KOCELOVICE, KRAJNÍČKO, KRTY-HRADEC, KUŘIMANY, LAŽÁNKY, LAŽANY, LIBĚTICE, LNÁŘE, LOM, MAČKOV, MEČICHOV, MĚKYNEC, MILOŇOVICE, MNICHOV, MYŠTICE, NEBŘEHOVICE, NĚMČICE, NĚMĚTICE, NIHOŠOVICE, NIŠOVICE, NOVÁ VES, PŘEDMÍŘ, PŘEDNÍ ZBOROVICE, PŘEDSLAVICE, PŘECHOVICE, PŘEŠŤOVICE, SEDLICE, SOUSEDOVICE, STOŽICE, STRAŠICE, STRUNKOVICE NAD VOLYŇKOU, STŘELSKÉ HOŠTICE, ŠKVOŘETICE, TCHOŘOVICE, TŘEBOHOSTICE, TŘEŠOVICE, ÚLEHLE, UZENICE, UZENIČKY, VACOVICE, VELKÁ TURNÁ, VOLYNĚ, ZÁBOŘÍ
	TÁBOR	BOROTÍN, DRAŽIČKY, JISTEBNICE, NADĚJKOV, OPAŘANY, RADKOV, SVRABOV
THE PLZEŇ REGION	DOMAŽLICE	BABYLON, ČESKÁ KUBICE, CHODOV, KANIČKY, MEZHOLEZY, NOVÁ VES, TRHANOV, ÚSILOV
	KLATOVY	BĚHAŘOV, BEZDĚKOV, BOLEŠINY, BŘEŽANY, BUKOVNÍK, ČERNÍKOV, ČÍHAŇ, ČÍMICE, DEŠENICE, DLAŽOV, DOBRŠÍN, DOLANY, DOMORAZ, FRYMBURK, HNAČOV, HRADEŠICE, HRÁDEK, CHANOVICE, CHLISTOV, CHUDENICE, JANOVICE NAD ÚHLAVOU, KAŠPERSKÉ HORY, KLATOVY, KOLINEC, KOVČÍN, KVÁŠŇOVICE, LOMEC, MALÝ BOR, MAŇOVICE, MĚČÍN, MOKROSUKY, MYSLÍV, MYSLOVICE, NALŽOVSKÉ HORY, NEZAMYSLICE, OLŠANY, OSTŘETICE, PAČEJOV, POLEŇ, PŘEDSLAV, SLATINA, SOBĚŠICE, STRÁŽOV, SVÉRADICE, TÝNEC, TUŽICE, VELKÝ BOR, ZAVLEKOV, ZBOROVY, ŽICHOVICE

	PLZEŇ - CITY	LHŮTA
	PLZEŇ - SOUTH	ČMELÍNY, DOLNÍ LUKAVICE, DRAHKOV, HORNÍ LUKAVICE, HORŠICE, HRADEC, HRADIŠTĚ, CHOCENICE, JAROV, KASEJOVICE, KBEL, KLÁŠTER, MÍŠOV, MOHELNICE, NEKVASOVY, NEPOMUK, NETUNICE, NEURAZY, NEZDŘEV, NOVÉ MITROVICE, OSELCE, PTENÍN, PRÁDLO, SRBY, TŘEBČICE, TÝNIŠTĚ, ÚNĚTICE, VLČTEJN, VRČEŇ, ŽDÍREC, ŽINKOVY
	PLZEŇ - NORTH	BOHY, DOLANY, LOCHOUSICE
	ROKYCANY	BŘEZINA, KAMENEC, KAKEJCOV
	TACHOV	BROD NAD TICHOU, HOŠŤKA, LESNÁ, STARÉ SEDLO, TISOVÁ, ZADNÍ CHODOV
THE KARLOVY VARY REGION	CHEB	DOLNÍ ŽANDOV, KRÁSNÁ, KŘIŽOVATKA, MILÍKOV, PLESNÁ, POUSTKA, PRAMENY, SKALNÁ, STARÁ VODA, VALY, VOJTANOV
	KARLOVY VARY	ABERTAMY, ANDĚLSKÁ HORA, BOŽÍ DAR, BŘEZOVÁ, ČERNAVA, DĚPOLTOVICE, HORNÍ BLATNÁ, HROZNĚTÍN, JÁCHYMOV, KOLOVÁ, MERKLÍN, NEJDEK, NOVÉ HAMRY, PERNINK, PILA, POTŮČKY, SMOLNÉ PECE, STANOVICE, STRUŽNÁ, VYSOKÁ PEC, TEPLIČKA
	SOKOLOV	HORNÍ SLAVKOV, JINDŘICHOVICE, KRASLICE, KRÁSNO, KYNŠPERK NAD OHŘÍ, LOKET, PŘEBUZ, ROTAVA, ŠINDELOVÁ
THE ÚSTÍ REGION	CHOMUTOV	KALEK, LOUČNÁ
	MOST	KLÍNY
	TEPLICE	DUBÍ, HROB, JENÍKOV, PROBOŠTOV
THE LIBEREC REGION	JABLONEC NAD NISOU	ALBRECHTICE V JIZERSKÝCH HORÁCH, DALEŠICE, DESNÁ, JANOV NAD NISOU, JOSEFŮV DŮL, KOŘENOV, LUČANY NAD NISOU, MARŠOVICE, NOVÁ VES NAD NISOU, RÁDLO, SMRŽOVKA
	LIBEREC	BÍLÝ POTOK, HEJNICE, LIBEREC, OLDŘICHOV V HÁJÍCH, STRÁŽ NAD NISOU
	SEMILY	HARRACHOV, PASEKY NAD JIZEROU
THE HRADEC KRÁLOVÉ REGION	RYCHNOV NAD KNĚŽNOU	ZDOBNICE
	TRUTNOV	KLÁŠTERSKÁ LHOTA, KUNČICE NAD LABEM, MLADÉ BUKY, PEC POD SNĚŽKOU, VRCHLABÍ
THE PARDUBICE REGION	CHRUDIM	BÍTOVANY, BOŘICE, CTĚTÍN, ČANKOVICE, DOLNÍ BEZDĚKOV,

		HLINSKO, HONBICE, HROCHŮV TÝNEC, JENÍKOV, JENIŠOVICE, LEŠTINKA, NABOČANY, POKŘIKOV, PROSETÍN, PŘESTAVLKY, RANÁ, STUDNICE, TRHOVÁ KAMENICE, TROJOVICE, ÚHŘETICE, VÍTANOV, VOJTĚCHOV, VORTOVÁ, VYŽICE, ZÁJEZDEC
	PARDUBICE	HOLOTÍN
	SVITAVY	BŘEZINY, HARTINKOV
	ÚSTÍ NAD ORLICÍ	PASTVINY
THE VYSOČINA REGION	HAVLÍČKŮV BROD	BOJIŠTĚ, DOLNÍ MĚSTO, DOLNÍ SOKOLOVEC, HORNÍ PASEKA, KAMENNÁ LHOTA, KOUTY, LIPNICE NAD SÁZAVOU, POHLED, RUŠINOV, TRPIŠOVICE, ÚSOBÍ
	JIHLAVA	BÍLÝ KÁMEN, BRTNICE, CEJLE, DUDÍN, HUBENOV, JERSÍN, JEŽENÁ, KALIŠTĚ, KAMENICE, KLATOVEC, KNÍNICE, MILÍČOV, MIROŠOV, MRÁKOTÍN, OLŠÍ, OPATOV, PUKLICE, ŘÍDELOV, SMRČNÁ, ŠIMANOV, VĚTRNÝ JENÍKOV, ZBILIDY
	PELHŘIMOV	HOJANOVICE, JANKOV, KALIŠTĚ, KOBEROVICE, NOVÝ RYCHNOV, PROSEČ, ÚSTRAŠÍN, VESELÁ
	TŘEBÍČ	BENETICE, BOCHOVICE, BRANSOUZE, BUDIŠOV, ČIKOV, ČÍMĚŘ, DOLNÍ VILÉMOVICE, HLUBOKÉ, HODOV, HORNÍ HEŘMANICE, HORNÍ ÚJEZD, HORNÍ VILÉMOVICE, HROZNATÍN, JASENICE, KAMENNÁ, KLUČOV, KOJATÍN, KOŽICHOVICE, KRALICE NAD OSLAVOU, LIPNÍK, MIKULOVICE, NALOUČANY, NÁRAMEČ, NOVÝ TELEČKOV, OCMANICE, OKŘEŠICE, OSTAŠOV, PETRŮVKY, POZĎATÍN, PŘECKOV, PYŠEL, RAPOTICE, ROHY, RUDÍKOV, SLAVIČKY, SMRK, STAŘEČ, STŘÍTEŽ, STUDNICE, SVATOSLAV, TRNAVA, TŘEBÍČ, VALDÍKOV, VLADISLAV, VLČATÍN, ZAHRÁDKA
	ŽĎÁR NAD SÁZAVOU	BALINY, BŘEZÍ, BŘEZSKÉ, DAŇKOVICE, DOLNÍ HEŘMANICE, HAMRY NAD SÁZAVOU, HORNÍ RADSLAVICE, CHLUMEK, JABLOŇOV, JIMRAMOV, KADOV, KARLOV, KRÁSNÉ, KŘÍDLA, KŘIŽÁNKY, MĚŘÍN, MEZIŘÍČKO, NOVÉ SADY, NOVÝ JIMRAMOV, OSLAVIČKA, OŘECHOV, OSLAVICE, OSOVÉ, OTÍN, PAVLÍNOV, PETRÁVEČ, PÍSEČNÉ, RUDA, SÁZAVA, SKŘINÁŘOV, SNĚŽNÉ, STRÁNECKÁ ZHOŘ, TASOV, UHŘÍNOV, VĚCHNOV, VELKÁ BÍTEŠ, VELKÉ

		MEZIŘÍČÍ, VÍR, VLKOV, ZÁBLATÍ
THE SOUTH MORAVIAN REGION	BLANSKO	BUKOVINA, HOLŠTEJN, KRASOVÁ, NĚMČICE, SLOUP, SUDICE, VELENOV, ŽĎÁRNÁ
	BRNO - VENKOV	BRANÍŠKOV, HORNÍ LOUČKY, KATOV, KETKOVICE, KUŘIMSKÁ NOVÁ VES, LESNÍ HLUBOKÉ, LOMNIČKA, LUBNÉ, ŘIKONÍN, STANOVIŠTĚ, TIŠNOVSKÁ NOVÁ VES, ÚJEZD U TIŠNOVA, VŠECHOVICE, ŽĎÁREC
	VYŠKOV	OLŠANY, PODOMÍ
	ZNOJMO	BOSKOVŠTEJN, CHVALATICE, PETROVICE, SKALICE, SLATINA
THE OLOMOUC REGION	JESENÍK	KOBYLÁ NAD VIDNAVKOU, VELKÁ KRAŠ
	OLOMOUC	BOUZOV, DASKABÁT, LUKÁ, TĚŠETICE, VELKÝ ÚJEZD, STRUKOV
	PROSTĚJOV	BOHUSLAVICE, BRODEK U KONICE, BŘEZSKO, BUDĚTSKO, DZBEL, HAČKY, JESENEC, KONICE, LIPOVÁ, LUDMÍROV, OCHOZ, OTINOVES, POLOMÍ, RAKŮVKA, ROZSTÁNÍ, SKŘÍPOV, STRAŽISKO, SUCHDOL, ŠUBÍŘOV, VINCENCOV
	PŘEROV	LAZNÍČKY, POLKOVICE, STŘÍTEŽ NAD LUDINOU
	ŠUMPERK	BLUDOV, BOHDÍKOV, BRNÍČKO, KOPŘIVNÁ, PALONÍN, POSTŘELMŮVEK
THE MORAVIAN-SILESIAN REGION	BRUNTÁL	LESKOVEC NAD MORAVICÍ, ŠIROKÁ NIVA, ZÁTOR
	OPAVA	NOVÉ LUBLICE

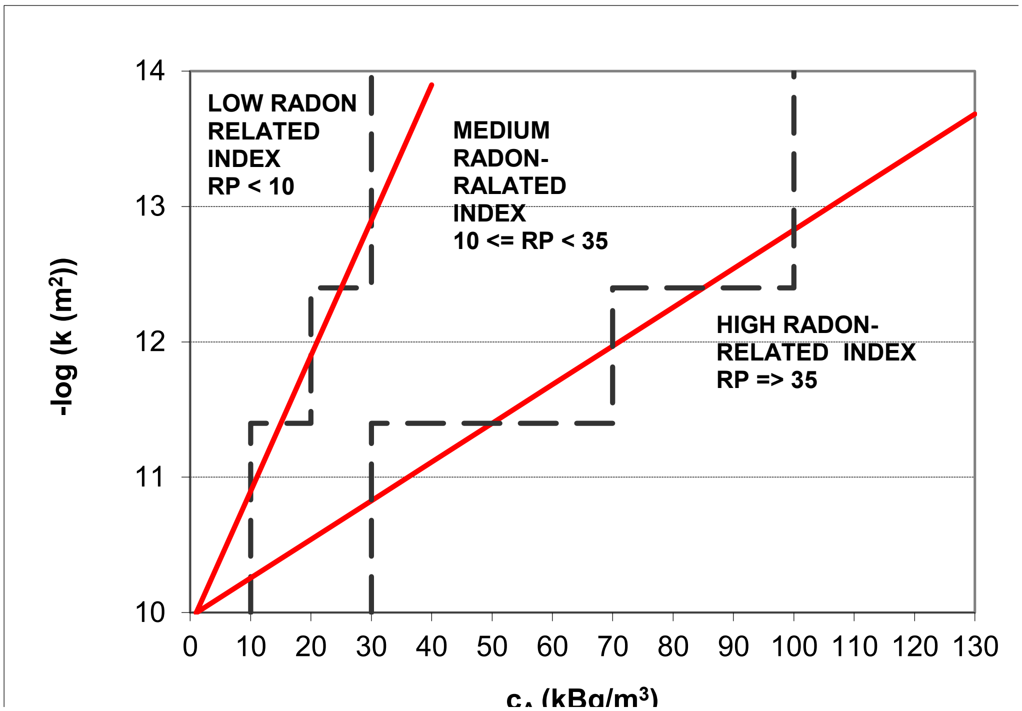
B. A condition indicating a possible increased exposure to radon in the workplace, regardless conditions set in point A, are also the following circumstances:

1. for a person who performs an activity during which a workplace is operated with possible increased exposure to radon, a natural person performs the work and
2. the value of 300 Bq/m^3 radon activity concentration has been found to have been exceeded in the indoor air of the workplace located in any floor of the building.

Annex 26 to Decree No. 422/2016 Coll.

Method of evaluating results to determine the radon –related index of a site

1. Determination based on the radon potential of a site



NÍZKÝ RADONOVÝ INDEX POZEMKU	LOW RADON – RELATED INDEX
STŘEDNÍ RADONOVÝ INDEX POZEMKU	MEDIUM RADON – RELATED INDEX
VYSOKÝ RADONOVÝ INDEX POZEMKU	HIGH RADON – RELATED INDEX

Legend:

RP– the radon potential of a site
k (m^2)– a statistical parameter, usually third quartile, of the set of measured values of gas permeability,
c_A (kBq/m^3)– a statistical parameter, usually third quartile, of the set of measured values of radon concentration in soil air

2. Determination when assessing gas permeability based on professional experience and knowledge

Property radon index	**Radon concentration in soil air (kBq/m^3)**		
Low	$c_A < 30$	$c_A < 20$	$c_A < 10$
Medium	$30 \le c_A < 100$	$20 \le c_A < 70$	$10 \le c_A < 30$
High	$c_A \ge 100$	$c_A \ge 70$	$c_A \ge 30$
	Low	*Medium*	*High*
	Gas permeability of soils		

Legend:

c_A (kBq/m^3) – a statistical parameter, usually third quartile, of the set of measured values of radon activity concentration in soil air

Annex 27 to Decree No. 422/2016 Coll.

Activity concentration of radon and natural radionuclide content in drinking water

Maximum permissible value of radon activity concentration in drinking water for public use and for making bottled water available on the market;

	Maximum permissible value
Rn-222	300 Bq/l

The reference level for natural radionuclide content in drinking water for public use and for making bottled water available on the market;

	Reference level
Rn-222	100 Bq/l
Indicative dose	0.1 mSv/year

Investigation levels of total alpha activity concentration and the total beta activity concentration

	Investigation levels		
Total alpha activity concentration		0.2 Bq/l	
Total beta activity concentration		0.5 Bq/l	

The method and scope of systematic measurement and evaluation of natural radionuclides in water

Basic analysis	activity concentration of Rn-222, in the case of water from an underground source total alpha activity concentration total beta activity concentration
Supplementary analysis	analysis of the presence of individual natural radionuclides in water that has been found to exceed investigation levels, according to the following procedure uranium content, if the total alpha activity concentration exceeds the investigation level activity concentration of Ra-226, if the total alpha activity concentration after subtraction of the contribution of uranium exceeds the investigation level activity concentration of Ra-228, if the total activity concentration of Ra-226 exceeds the investigation level of total alpha activity

	determination of other radionuclides emitting alpha radiation, if the total activity concentration after subtraction of the Ra-226 and uranium contribution exceeds the investigation level potassium content, if the total beta activity concentration exceeds the investigation level determination of other radionuclides emitting beta radiation, if the total activity concentration after subtraction of the contribution of K-40 exceeds the investigation level

The frequency of systematic measurement and evaluation of natural radionuclides in water

Volume of water distributed or produced daily [m³] *)	The number of samples per calendar year
volume ≤ 1 000	1
1 000 < volume ≤ 10 000	1 + 1 for every 3 300 m³/day, including portions thereof from the total volume
10.000 < volume ≤ 100 000	3 + 1 for every 10 000 m³/day, including portions thereof from the total volume
volume > 100 000	10 + 1 for every 25 000 m³/day, including portions thereof from the total volume

Legend:

*) Volumes are calculated as averages taken over the course of a calendar year.Frequency can also be determined from the number of supplied inhabitants, assuming water consumption of 200 l/day per natural person.

Annex 28 to Decree No. 422/2016 Coll.

Building material pursuant to § 9(2)(j) of the Atomic Act

Construction material pursuant to § 9(2)(j) of the Atomic Act is

1. natural stone and stony products mined in the Czech Republic intending for building purposes, including building products made from such materials
    1. granite, granodiorite, syenite, pegmatite, aplite, granit porfyry, syenite porfyry, ryolite, phonolite, trachyte, andesite,
    2. clay, claystone, sandstone, sand, sandy gravel, kaolin, black shale , alum, shale, tuff, and
    3. orthogneiss, paragneiss, migmatite,
2. natural stone and stony products imported from state which is not a member of the European Union intended for building purpose, inclusive building products made from such materials,
3. artificial aggregates, in particular agloporite, perlite, expanded clay, geopolymers, and products thereof,
4. aerated concrete, clinker concrete, aerated concrete construction products, clinker concrete construction products,
5. fly ash, bottom ash, slag, gypsum arising from industrial processes, sludge intended to be used for construction purposes, materials from workplaces pursuant to § 92(1)(b) and (c) of the Atomic Act intended for building purposes, building products made from them not specified in other points, and
6. material from waste heaps: ore, coal, and waste heaps that remain after mining rocks set in point 1and tailings ponds intended for building purposes.

Annex 29 to Decree No. 422/2016 Coll.

The amount of absorbed dose above which emergency protective measures must be implemented immediately

Organ, tissue	The absorbed dose that is assumed or expected to be received over the course of less than 2 days [Gy]
Whole body	1[a)]
Lungs	6
Skin	3
Thyroid gland	5
Lens of the eye	1.5
Gonads	1

Legend:

a) The possibility of immediate damage to a foetus at anticipated doses greater than 0.1 Gy must be taken into consideration when justifying and optimising the current intervention level for immediate protective measures.