APPROVED
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LITHUANIAN HYGIENE STANDARD HN 73:2018 „BASIC RADIATION PROTECTION STANDARDS“

CHAPTER I
SCOPE

1. Lithuanian hygiene standard HN 73:2018 „Basic radiation protection standards“ (thereafter – hygiene standard) establish legal requirements, which applies to individuals subject to occupational, medical (including unintended exposure) and public exposure in any planned, existing or emergency exposure situation which involves a risk from exposure to ionising radiation which cannot be disregarded from a radiation protection point of view or with regard to the environment in view of long-term human health protection.

2. Hygiene standard applies to:

2.1. the manufacture, processing, handling, use (including reuse), holding and storage of radioactive material or any equipment incorporating radioactive sources and disposal of radioactive waste;

2.2. the manufacture and the operation of electrical equipment emitting ionising radiation and containing components operating at a potential difference of more than 5 kilovolt (kV);

2.3. the trade, installation, maintenance and repair of sources of ionising radiation (thereafter – sources);

2.4. the domestic transport, transit, import to, and export from the Republic of Lithuania of radioactive material and radioactive waste;

2.5. human activities which involve the presence of natural radiation sources that lead to a significant increase in the exposure of workers (thereafter – exposed worker) or members of the public, in particular:

2.5.1. the operation of aircraft and spacecraft, in relation to the exposure of crews;

2.5.2. the processing of materials with naturally-occurring radionuclides;

2.6. the exposure of workers or members of the public to indoor radon;

2.7. external exposure from building materials;

2.8. cases of lasting exposure resulting from the after-effects of an emergency or a past human activity;

2.9. the preparedness for, the planning of response to and the management of emergency exposure situations that are deemed to warrant measures to protect the health of members of the public or workers.

3. Hygiene standard does not apply to:

3.1. exposure to the natural level of radiation, such as radionuclides contained in the human body and cosmic radiation prevailing at ground level;

3.2. exposure of members of the public or workers other than air or space crew to cosmic radiation in flight or in space;

3.3. aboveground exposure to radionuclides present in the undisturbed earth's crust.

4. Hygiene norm regulates activities with sources in the field of nuclear energy to the extent not regulated by legal acts regulating activities with sources in the field of nuclear energy.

CHAPTER II
REFERENCES

5. Legislation to which the Hygiene Norm refers:

5.1. Law on Radiation Protection of the Republic of Lithuania;

5.2. Law on Radioactive Waste Management of the Republic of Lithuania;

5.3. Law on Nuclear Safety of the Republic of Lithuania;

5.4. Law on Construction of the Republic of Lithuania;

5.5. Law on Civil Protection of the Republic of Lithuania;

5.6. Law on Environmental Impact Assessment of Proposed Economic Activity of the Republic of Lithuania;

5.7. Resolution of the Government of the Republic of Lithuania No. 1295 On Approval of the Description of the Procedure for the Organization of Civil Protection Exercises, adopted on 8th of September, 2010;

5.8. Order of the Minister of Health of the Republic of Lithuania No. V-1040 On Approval of Lithuanian Hygiene Standard HN 99: 2011 "Protection of the Population in the Event of a Radiological or Nuclear Accident", adopted on 7th of December, 2011.

CHAPTER III
TERMS AND DEFINITIONS

6. Terms and definitions used in hygiene standard:

6.1. **Activity concentration index** - a dimensionless value used for estimation of gamma radiation emitted by building materials and which is calculated from the activity concentration of ^{226}Ra, ^{232}Th, ^{40}K and ^{137}Cs radionuclides in the building materials.

6.2. **Ambient dose equivalent ((H*(10))** – the dose equivalent at a point in a radiation field that would be produced by the corresponding expanded and aligned field in the ICRU sphere at depth of 10 mm on the radius opposing the direction of the aligned field. The quantity is used for assessment of effective dose in the workplaces and living environment. The unit of ambient dose equivalent is sievert (Sv).

6.3. **Dose constraint** – a value of prospective individual dose, set to define the options considered in the process of optimisation for a given radiation source in a planned exposure situation.

6.4. **Health screening** – means a procedure using medical radiological installations for early diagnosis in population groups at risk.

6.5. **Stochastic effects caused by ionizing radiation –** radiation induced health effects, the probability of occurrence of which is greater for a higher radiation dose and the severity of which (if it occurs) is independent of dose.

6.6. **Emergency response plan** – the document were arrangements are set to plan for adequate response in the event of an emergency exposure situation on the basis of postulated events and related scenarios;

6.7. **Emergency occupational exposure** – exposure received in an emergency exposure situation by an emergency worker.

6.8. **Becquerel (Bq)** – name of the unit of activity. One Becquerel is equivalent to one nuclear transition per second: 1 Bq = 1 s^{-1}.

6.9. **D value** (hereinafter – D) **–** activity of radionuclides in radioactive source, at which radioactive source, if it is not properly controlled, can induce severe deterministic effects.

6.10. **Diagnostic reference levels** – dose levels in medical radiodiagnostic or interventional radiology practices, or, in the case of radio-pharmaceuticals, levels of activity, for typical examinations for groups of standard-sized patients or standard phantoms for broadly defined types of equipment;

6.11. **High-activity sealed radioactive source** (hereinafter – high-activity sealed source) – a sealed source for which the activity of the contained radionuclide is equal to or exceeds the relevant activity value laid down in Annex I.

6.12. **Dose** – the quantitative value of energy absorbed during exposure situation.

6.13. **Effective dose (E)** – the sum of the weighted equivalent doses in all the tissues and organs of the body from internal and external exposure. It is defined by the expression:

$$E = \sum_T w_T H_T = \sum_T w_T \sum_R w_R D_{T,R} ,$$

where

$D_{T,R}$ is the absorbed dose averaged over tissue or organ T, due to radiation R,

w_R is the radiation weighting factor and,

w_T is the tissue weighting factor for tissue or organ T.

The values for w_T and w_R are specified in Annex II. The unit for effective dose is the sievert (Sv).

6.14. **Spacecraft** – a manned vehicle designed to operate at an altitude of more than 100 km above sea level.

6.15. **Potential exposure** – an exposure that is not expected with certainty but may result from an event or sequence of events of a probabilistic nature, including equipment failures and operating errors.

6.16. **Extremities** – the hands, forearms, feet and ankles.

6.17. **Natural radiation source** – a source of ionising radiation of natural, terrestrial or cosmic origin.

6.18. **Accelerator** – equipment or installation in which particles are accelerated, emitting ionising radiation with energy higher than 1 mega electron volt (MeV).

6.19. **Individual detriment** – clinically observable deleterious effects in individuals or their descendants, the appearance of which is either immediate or delayed and, in the latter case, implies a probability rather than a certainty of appearance.

6.20. **Personal dose equivalent (Hp(d))** – the dose equivalent in soft tissue at an appropriate depth, d, below a specified point on the human body. For the assessment of effective dose, a depth d of 10 mm is used, for the assessment of equivalent dose to the lens of the eye a depth d is 3 mm, for the assessment of equivalent dose to the skin and extremities a depth d is 0.07 mm. The personal dose equivalents are measured with personal dosemeters worn on the human body. The unit of personal dose equivalent is sievert (Sv).

6.21. **Interventional radiology** – the use of X-ray imaging techniques to facilitate the introduction and guidance of devices in the body for diagnostic or treatment purposes.

6.22. **Intake** – the total activity of a radionuclide entering the body from the external environment.

6.23. **Committed effective dose (E(τ))** – the sum of the committed organ or tissue equivalent doses $H_T(\tau)$ resulting from an intake, each multiplied by the appropriate tissue weighting factor w_T. It is defined by:

$$E(\tau) = \sum_T w_T H_T(\tau) ,$$

In specifying $E(\tau)$, τ is given in the number of years over which the integration is made. τ is a period of 50 years following intake for adults and up to the age of 70 for infants and children. The unit for committed effective dose is the sievert (Sv).

6.24. **Committed equivalent dose (H T (τ))** – the integral over time (t) of the equivalent dose rate in tissue or organ T that will be received by an individual as a result of an intake.

It is given by:

$$H_T(\tau) = \int_{t_0}^{t_0+\tau} \dot{H}_T(t)\, dt\,,$$

for an intake at time t_0 where $\dot{H}_T(t)$ is the relevant equivalent dose rate in organ or tissue T at time *t*, τ is the time over which the integration is performed.

In specifying $H_T(\tau)$ is given in number of years over which the integration is made. τ is a period of 50 years for adults and up to the age of 70 for infants and children. The unit for committed equivalent dose is the sievert (Sv).

6.25. **Clinical audit** – a systematic examination or review of medical radiological procedures which seeks to improve the quality and outcome of patient care through structured review, whereby medical radiological practices, procedures and results are examined against agreed standards for good medical radiological procedures, with modification of practices, where appropriate, and the application of new standards if necessary.

6.26. **Quality control** – the set of operations (programming, coordinating, implementing) intended to maintain or to improve quality. It includes monitoring, evaluation and maintenance at required levels of all characteristics of performance of equipment that can be defined, measured, and controlled;

6.27. **Collective dose** – the sum of of the individual doses of the group of members of the population.

6.28. **Passbook of outside worker‘s exposure** – mandatory document of established form, in which the data of outside worker’s exposure doses received during the work at the undertaking, accepting outside worker, are recorded.

6.29. **Undertaking accepting outside workers** – undertaking performing authorised activities and responsible for the supervised and controlled areas, in which outside worker performs (or plans to perform) activities.

6.30. **Employer of outside workers** – persons who has a right to perform an authorized activity with radiation sources and performing such activity (or the workers of employer performs such activity) in the supervised and controlled areas of the undertaking accepting outside workers.

6.31. **Competent authority** – state authority or other state institution designated as having legal mandate to perform functions related to radiation protection.

6.32. **Controlled area** – an area subject to special rules for the purpose of protection against ionising radiation or preventing the spread of radioactive contamination and to which access is controlled.

6.33. **Directional dose equivalent (H’(d, Ω))** – 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, d, on a radius in a specified direction, Ω. The quantity is used for dosimetry in the workplaces or living environment. For the assessment of equivalent dose to the skin and extremities a depth d is 0.07 mm, for the assessment of equivalent dose to the lens of the eye a depth d is 3 mm. The unit of directional dose equivalent is sievert (Sv).

6.34. **Equivalent dose (H_T)** – the absorbed dose, in tissue or organ T weighted for the type and quality of radiation R. It is given by:

$$H_{T,R} = w_R D_{T,R}\,,$$

where

$D_{T,R}$ is the absorbed dose averaged over tissue or organ T, due to radiation R, w_R is the radiation weighting factor.

When the radiation field is composed of types and energies with different values of w_R, the total equivalent dose, H_T, is given by:

$$H_T = \sum_R w_R D_{T,R} ,$$

The values for w_R are specified in Annex 2, Part A. The unit for equivalent dose is the sievert (Sv).

6.35. **Medical radiology** – radiodiagnostic and radiotherapeutic procedures, and interventional radiology or other planning, guiding and verifying radiology using ionizing radiation.

6.36. **Equipment of medical radiology** – object in which medical radiology procedures are performed.

6.37. **Medical physics expert** – individual having the knowledge, training and experience to act or give advice on matters relating to radiation physics applied to medical exposure, whose competence in this respect is recognised by the order established by ministry of health.

6.38. **Non-medical imaging exposure** – any deliberate exposure of humans for imaging purposes where the individual being exposed by non-medical exposure.

6.39. **Unintended exposure** – means medical exposure that is significantly different from the designated medical exposure.

6.40. **Normal exposure** – exposure expected to occur under the normal operating conditions of a facility or activity (including maintenance, inspection, decommissioning), including minor incidents that can be kept under control, i.e. during normal operation and anticipated operational occurrences.

6.41. **Deterministic effects caused by ionizing radiation** – a health effect of radiation for which generally a threshold level of dose exists above which the severity of the effect is greater for a higher dose.

6.42. **Referrer** – a medical doctor, dentist or other health professional who is entitled to refer individuals for medical radiological procedures to a practitioner.

6.43. **Remedial measures** – the removal of a radiation source or the reduction of its magnitude (in terms of activity or amount of sources) or the interruption of exposure pathways or the reduction of their impact for the purposes of avoiding or reducing doses that might otherwise be received in an existing exposure situation.

6.44. **Practical aspects of medical radiological procedures** – the physical conduct of a medical exposure and any supporting aspects, including handling and use of medical radiological equipment, the assessment of technical and physical parameters (including radiation doses), calibration and maintenance of equipment, preparation and administration of radio-pharmaceuticals, and image processing.

6.45. **Practitioner performing mandatory health examination** – practitioner having qualification acknowledged by order established by ministry of health, performing medical examination of exposed workers and emergency workers.

6.45[1]. **Processing of radioactive materials** – chemical or physical operations on radioactive material changing their chemical or physical properties.

6.46. **Risk category of radioactive sources** (hereinafter – category) – The level of danger of sources determined by D value. The risk categories and the order of their determination is established in Annex 1.

6.47. **Radioactive contamination** – the unintended or undesirable presence of radioactive substances on surfaces or within solids, liquids or gases or on the human body.

6.48. **Radon** – the radionuclide Rn-222 and its progeny.

6.49. **Exposure to radon** – exposure to radon progeny.

6.50. **Representative person** – an individual receiving a dose that is representative of the more highly exposed individuals in the population, excluding those individuals having extreme or rare habits;

6.51. **Storage** – the holding of radioactive material or radioactive source in a facility with the intention of retrieval.

6.52. **Sievert (Sv)** – the special name of the unit of equivalent or effective dose. One sievert is equivalent to one joule per kilogram: 1 Sv = 1 J kg^{-1}.

6.53. **Radiotherapy** – treatment using ionizing radiation, including nuclear medicine for therapeutic purposes.

6.54. **Standard values and relationships** – values and relationships recommended in chapters 4 and 5 of International Commission on Radiological Protection (hereinafter – ICRP) Publication 116 for the estimation of doses from external exposure and chapter 1 of ICRP Publication 119 for the estimation of doses from internal exposure, including updates approved by Member States. The ministry of health may approve the use of specific methods in specified cases relating to the physico-chemical properties of the radionuclide or other features of the exposure situation or of the exposed individual;

6.55. **Supervised area** – an area subject to supervision for the purpose of protection against ionising radiation.

6.56. **Absorbed dose (D)** – the energy absorbed per unit mass

$$D = \frac{d\bar{\varepsilon}}{dm},$$

where

$d\bar{\varepsilon}$ is the mean energy imparted by ionising radiation to the matter in a volume element,

dm is the mass of the matter in this volume element.

Absorbed dose denotes the dose averaged over a tissue or an organ. The unit for absorbed dose is the gray (Gy) where one gray is equal to one joule per kilogram: 1 Gy = 1 J · kg^{-1}.

6.57. **Severe deterministic effects caused by ionising radiation** – deterministic effects destined by ionising radiation, which are lethal or life threatening or cause permanent health disorders, which worsen quality of life of human beings.

6.58. **Thoron** – the radionuclide Rn-220 and its progeny.

6.59. **Sealed radioactive source container** (hereinafter – source container) – an assembly of components intended to guarantee the containment of a sealed source, where it is not an integral part of the source but is meant for shielding the source during its transport and handling.

6.60. **Health detriment** – reduction in length and quality of life occurring in a population following exposure, including those arising from tissue reactions, cancer and severe genetic disorder.

6.61. Other terms and definitions are used as they are defined in [5.1–5.7].

CHAPTER IV
GENERAL REQUIREMENTS FOR RADIATION PROTECTION

SECTION 1
GENERAL PROVISIONS

7. The hygiene standard implements, but does not change, the legal framework for radiation protection set forth in [5.1, 5.2].

8. Hygiene standard is mandatory for:

8.1. citizens of the Republic of Lithuania or other Member States of the European Union or the European Economic Area (hereinafter – Member State), other natural persons

exercising their right of movement within the Member States, other organizations or their branches, as well as branches of legal persons or other organizations of other foreign state established in the Republic of Lithuania (hereinafter – Person):

8.1.1. planning to carry out a practice with sources of ionizing radiation (hereinafter – practice) or carrying out a practice:

8.1.1.1. manufacture, processing, use (including reuse), store, market, installation, maintain and repair of the sources;

8.1.1.2. import, export, transit or domestic transport in the Republic of Lithuania of radioactive materials or radioactive waste;

8.1.1.3. management of radioactive waste;

8.1.1.4. without own sources carrying out practices in the environment of ionizing radiation at a nuclear facility (hereinafter – nuclear facility) or at a facility of another person licensed to carry out practices with sources of ionizing radiation (hereinafter – license);

8.1.1.5. engagement in practice involving the use or production of materials containing naturally–occurring radioactive material or engagement in practice in existing exposure situation which cannot be disregarded from a radiation protection point of view and is subject to the radiation protection requirements set out for the practice in [5.1] and other legislation. List of the practices involving the use or production of materials containing naturally–occurring radioactive material causing occupational or public exposure which cannot be disregarded from a radiation protection point of view is provided in Annex 3.

8.1.2. installation of workplaces located on the basement or at underground buildings, also workplaces located on the first floors and basements in building, situated at radon risk zones;

8.1.3. operation of aircraft and spacecraft;

8.1.4. design and construction of facilities, where sources are used (are planed to be used);

8.1.5. manufacturing or supplying building materials;

8.1.6. providing radiation protection expert or medical physicist expert services;

8.2. referrers;

8.3. the officials of the regulatory body empowered to perform state radiation protection supervision in order to ensure the compliance with the requirements of hygiene standards and the authorities responsible for the taking of protective actions;

9. In the cases referred to in [5.1], the persons required to notify justified practice shall provide the information enlisted below:

9.1. undertaking and his business address;

9.2. description of the practice;

9.3. the sources that cause or are likely to cause exposure and their characteristics;

9.4. information on the exposure of persons or groups of persons who are or may be exposed to radiation (methods of exposure, doses received);

10. Practice is exempted if it meets general exemption criteria and does not exceed the exemption values set out in Annex IV.

11. Persons planning to carrying out the practice or undertaking carrying out the practice must allocate as much human and financial resources as necessary to ensure the radiation protection.

12. Any breach of the hygiene standard must be promptly investigated, identified, reported to the regulatory body and measures put in place to prevent any recurrence.

13. Persons planning to carrying out the practice or undertaking carrying out the practice unable or only partially complying with a hygiene standard, must indicate alternative radiation protection measures and justify that non-compliance or partial compliance with the hygiene standard will not adversely affect radiation protection of workers, patients or the public. The regulatory body, having assessed the information provided, shall inform the persons or undertaking referred to in this paragraph of its acceptance of the alternative radiation protection

measures and of this justification, if information provided demonstrates that the radiation protection of workers, patients or public will not downgrade. Otherwise regulatory body declines proposed alternative measures and requires to ensure that practice is not continued until adequate radiation protection (equivalent to the hygiene requirements) for workers, patients or public is achieved.

14. Persons planning to carrying out the practice or undertaking carrying out the practice must ensure that, where the requirements of para. 48 and paras. 79.2, 97.1, 104.3.3 and 142.6 require consultation with an radiation protection expert or medical physics expert, workers and persons responsible for radiation protection are given the opportunity to seek necessary advice.

15. The undertaking planning to carry out and already carrying out the practice at all stages of the source life (from design and / or production of the source to its decommissioning, return to the supplier or management as radioactive waste) must seek to minimize the impact of the human factor for safety. The undertaking designing and / or manufacturing equipment with radioactive sources or radiation generators seeking to minimize the impact of the human factor on radiation protection must ensure that:

15.1. sound ergonomic principles are followed in the design of equipment incorporating sources or radiation generators and the development of operating procedures, so as to facilitate the safe operation and use of equipment incorporating sources or radiation generators, to minimize the possibility that operator errors could lead to incidents or accidents, and to reduce the possibility that indications of normal conditions and abnormal conditions could be misinterpreted;

15.2. the undertaking supplying or using equipment incorporating sources or radiation generators is provided with appropriate equipment, safety systems and procedural requirements, and other necessary provision is made:

15.2.1. to reduce, as far as practicable, the possibility that human errors or inadvertent actions could give rise to accidents or to other incidents leading to the exposure of any person;

15.2.2. to provide means for detecting human errors and for correcting them or compensating for them;

15.2.3. to facilitate protective measures and corrective actions in the event of failures of safety systems or failures of measures for protection and safety of equipment incorporating sources or radiation generators.

16. Remuneration paid to workers, compensation for special working conditions, reduced working hours, extended leave and other special compensation measures cannot replace the radiation protection measures that must be implemented to comply with the requirements of the hygiene norm and other radiation protection legislation.

17. Persons planning to carry out the practice or the undertaking must implement and maintain a safety culture that encourages the undertaking and workers to improve radiation protection.

18. Radiation Protection Centre must assess the compliance of the documentation submitted by the employer of outside worker who applied for the Passbook of outside worker‘s exposure with the requirements of the hygiene standard on the basis of data received from the employer of outside worker and the undertaking accepting outside workers, and registers and information systems used for the conformity assessment of documents or based on other evidence provided. The employer of outside worker or the undertaking accepting outside worker shall not be required to provide the documents and / or information already provided to the Radiation Protection Centre by the employer of outside worker or the undertaking accepting outside worker, except where the data and / or information provided by the employer of outside worker or the undertaking accepting outside worker is subject to change, also in case data and / or information may be obtained by the Radiation Protection Centre itself. Personal data shall be processed in accordance with the requirements of legal acts of the Republic of Lithuania and the European Union regulating the protection of personal data. The purpose of processing personal

data is to assess the compliance of the documents submitted by the employer of outside worker and the undertaking accepting outside workers with the requirements of the hygiene standard. Documents provided by the employer of outside worker and the Passbook of outside worker‘s exposure shall be retained for 10 years from the date of receipt. In the event of refusal to issue a Passbook of outside worker‘s exposure, the documents and data submitted by the employer of outside worker and any other relevant documents and data shall be kept for 10 years from the date of receipt.

SECTION 2
REFERENCE LEVELS

19. The reference levels set out in para. 84, 170, 173 and 180 and Annex 5 shall be used for the optimization of exposure in emergency and existing situations, taking into account radiation protection requirements and social factors affecting human exposure. The reference level for radon exposure in the existing exposure situation, set in terms of radon activity concentration in air, is specified in paras. 86 and 165.

20. Optimisation of radiation protection shall be applied to exposures above the reference level specified in para. 19 and optimisation measures shall continue to be implemented below the reference level.

SECTION 3
DOSE CONSTRAINTS

21. Dose constraints are established for the purpose of optimisation of radiation protection in planned exposure situation for the following groups of people:

21.1. workers, apprentices and students;

21.2. members of the public;

21.3. carers and comforters and volunteers participating in medical or biomedical research.

22. Dose constraints (annual effective or equivalent doses) for workers, apprentices, students and volunteers participating in medical or biomedical research, who will not receive direct medical benefit, shall be established by undertaking agreed with the regulatory body.

23. Dose constraints (annual effective or equivalent doses) for outside workers shall be established by employer of outside workers in cooperation with the undertaking accepting outside workers.

24. Dose constraints (annual effective doses) are:

24.1. for the exposure of carers and comforters per one patient care – 5 mSv;

24.2. for members of the public due to release of radioactive materials to the environment and exposure directly from the source, except exposure from nuclear facility– 0,3 mSv;

24.3. for members of the public due to activities where naturally occurring radioactive substances are used or produced – 0,3 mSv;

24.4. for members of the public due to release of radioactive materials to the environment from nuclear facility, receiving directly from nuclear facility – 0,2 mSv.

25. Dose constraint for members of the public from nuclear facility is applied as follows:

25.1. dose constraint set in para. 24.4. is applied for design, operation (during the normal operation), decommissioning of the nuclear facility and evaluating exposure of members of the public from closed radioactive waste disposal facilities. If the exposure of the members of the public may arise from activities of more than one nuclear facility, the total annual effective dose of members of the public due to the activity of all nuclear facilities that cause the exposure may not exceed the dose constraint specified in paragraph 24.4;

25.2. dose constraint set in para. 24.4. is applied for members of the public, who live and perform economic activities beyond the boundaries of nuclear facility sanitary protection zone, but who may enter (taking into account statistics on the habits and dietary habits of the local population) economic activities not related to the construction, operation, decommissioning of the nuclear facility or maintenance of closed radioactive waste repositories in the nuclear facility sanitary protection zone;

25.3. dose constraint for members of the public set in para. 24.4. shall not be applied to individuals permanently or temporarily employed in the nuclear facility and engaged in activities related to the construction, operation, decommissioning or maintenance of the closed radioactive waste repository within the nuclear facility sanitary protection zone and not assigned to category A nor to category B workers. They are subject to the dose limits of members of the public.

SECTION 4
DOSE LIMITS

26. In order to implement risk and dose limitation for individuals principle, dose limits set in Annex 6 are established for these groups of individuals:

26.1. workers, apprentices and students;

26.2. members of the public.

27. Dose limits for apprentices and students aged 18 years or over who, in the course of their studies, are obliged to work with sources, shall be the same as the dose limits for workers;

28. Dose limits for apprentices and students, who in the course of their studies, are not obliged to work with radiation sources, shall be the same as for members of the public.

29. Dose limits for emergency workers shall not exceed dose limits for workers set in Annex 6, except cases, when dose constrains laid down in para. 84 shall be applied.

30. The sum of annual occupational exposure doses of a worker from all authorised practices, occupational exposure to radon in workplaces and other occupational exposure from existing exposure situations, shall not exceed dose limits for occupational exposure.

31. The sum of annual exposure doses of a member of the public resulting from all authorised practices, shall not exceed dose limits for members of the public.

SECTION 5
RADIATION PROTECTION OF PREGNANT AND BREASTFEEDING WORKERS, APPRENTICES AND STUDENTS

32. Radiation protection of pregnant and breastfeeding workers, apprentices and students shall be ensured following requirements laid down in [5.1]. Radiation protection of the fetus shall be the same as for member of the public. As soon as a pregnant worker, apprentice or student informs of the pregnancy, the employment conditions for the pregnant worker, apprentice or student shall be such, that the equivalent dose to the fetus shall be as low as reasonably achievable and unlikely to exceed 1 mSv during at the remainder of the pregnancy.

SECTION 6
RADIATION PROTECTION TRAINING AND INSTRUCTION OF WORKERS

33. The undertaking shall provide workers with radiation protection training by appropriate radiation protection training programmes and instruction on radiation protection, in accordance with [5.1]. Instruction of workers shall be done by written instructions, approved by the undertaking that set the organizational, technical and medical requirements for workers that must be complied with to ensure radiation protection.

34. During the instruction, workers shall be informed on:

34.1. general radiation protection procedures, that also include information on ionizing radiation health risk and measures to be taken to ensure radiation protection, including set out dose constraints;

34.2. radiation protection procedures that describe operational and working conditions of workers, which are prepared taking into account hazard involved and measures to be taken to ensure radiation protection carrying out a practice with source. The radiation protection procedures for workers involved in work with high-activity sealed sources, shall include requirements for the safe management and control of high-activity sealed sources and contain information on the possible consequences of the loss of adequate control of high-activity sealed sources.

34.3. emergency response plan and procedures or their parts applied to the specific work (manufacturing processes) or workstations;

35. The undertaking shall ensure, that during the instruction female workers are informed on occupational exposure impact on the unborn child and on the importance of making an early declaration of pregnancy to the undertaking. Female workers, that intent to breast-feed infants, shall be informed on the importance of announcing, as early as possible, the intention to breast-feed an infant to the undertaking in view of the risk of exposure for a breast-fed infant due to internal exposure of female worker or external radioactive contamination.

CHAPTER V
OCCUPATIONAL EXPOSURE

SECTION 1
RESPONSIBILITIES OF UNDERTAKING AND WORKERS

36. The undertaking is responsible for implementation of the radiation protection measures (legal, organizational and technical (engineering, individual, etc.)) applied to workers in accordance with the Hygiene Standard. In the case of outside workers, the responsibilities of the undertaking and the employer of outside workers are stipulated in Section 8 of this Chapter.

37. The undertaking shall create working conditions using engineering instruments (protective partitions, walls, ceilings, etc.) with the aim to minimize the need to rely on organisational measures specified in the Radiation protection programme (e.g. permit for working activities, marking of premises, access control to certain premises, etc.) and personal protective equipment. In ensuring the radiation protection of workers, the highest priority must be given to engineering measures, less to organisational measures, the least for individual protection measures.

38. Undertaking shall implement radiation protection measures regarding all workplaces where workers are liable to receive an exposure greater than an effective dose of 1 mSv per year or an equivalent dose of 15 mSv per year for the lens of the eye or 50 mSv per year for the skin and extremities.

39. Radiation protection of workers shall be guaranteed by implementing these organizational measures:

39.1. prior radiological evaluation and safety assessment in order to evaluate the nature and magnitude of the radiological risk to exposed workers;

39.2. optimisation of radiation protection;

39.3. classification of working areas;

39.4. classification of workers into different categories;

39.5. performance of individual monitoring and radiological surveillance of the workplace;

39.6. arrangement of medical surveillance for exposed workers in accordance with [5.1];

39.7. arrangement of education and training in accordance with [5.1].

40. The undertaking shall designate radiation protection officer for supervision of radiation protection. Undertaking, carrying out registered practice, may authorize a person who does not have any employment or other legal relationship with that undertaking (in relation to the employment relationship) to perform the functions of the radiation protection officer. Radiation protection implementation functions may be delegated to the radiation protection officer, but the prime responsibility for radiation protection cannot be delegated. The task of the radiation protection officer may be carried out by a radiation protection unit established within an undertaking or by a radiation protection expert. Radiation protection officer, radiation protection unit or radiation protection expert shall report directly to the undertaking.

41. Undertaking shall provide officers mentioned in para. 40 with the means necessary for them to carry out their tasks.

42. Undertaking shall:

42.1. ensure adequate human resources are provided to carry out working activities;

42.2. provide suitable and adequate facilities, equipment and services for protection and safety, the type and extent of which are commensurate with the expected likelihood and magnitude of occupational exposure;

42.3. ensure that the medical surveillance of workers is based on the principles that govern occupational medicine generally and mandatory health examination of workers is provided according to [5.1]. Upon request of a practitioner performing mandatory health examination, the worker may be directed to undergo a more detailed medical examination, be referred urgently for treatment and, if necessary – decontamination, provided psychological counselling and periodic health examination;

42.4. develop and implement Radiation protection program, in accordance with requirements set in para. 43;

42.5. provide personal protective equipment for workers and appropriate training, ensure proper use and testing. If expire date is not foreseen by the manufacturer of personal protective equipment it has to be tested 5 years after date of manufacture and every 2 years later on. In case of suspicion that personal protective equipment is damaged it cannot be used until it has been tested;

42.6. ensure that appropriate workplace monitoring equipment and personal protective equipment are provided for workers depending on their working conditions, and arrangements are made for its proper use, technical maintenance, calibration and quality control;

42.7. relevant documents are recorded and saved, concerning the decisions adopted related to radiation protection, also recorded and saved data, confirming that requirements of Hygiene Standard are met and make them available for regulatory body, workers and radiation protection officers;

42.8. facilitate consultation of and cooperation with workers with regard to protection and safety on all measures necessary;

42.9. provide training for workers on new techniques or new sources before starting activities using new techniques or new sources.

43. establish a radiation protection programme, including radiation protection objectives and radiation protection measures for achieving these objectives and implement this programme. Radiation protection programme includes:

43.1. description of organization and management of radiation protection;

43.2. description of designation and management of working areas;

43.3. description of local rules and (or) radiation protection instructions for workers to follow and the supervision of their implementation;

43.4. description of individual monitoring and radiological surveillance of the workplace;

43.5. description of radiation protection education and training for workers;

43.6. emergency response plan, including preparedness and response to radiological incidents and emergency;

43.7. description of mandatory health examination;

43.8. quality assurance programme;

43.9. description for periodically reviewing and auditing the performance of the radiation protection programme.

44. The undertaking shall ensure that:

44.1. working procedures shall include every working position and all the steps of work with the source that may affect radiation protection, such as: preparing the source for work, working with the source under normal working conditions, using personal protective equipment, managing radioactive waste and disused sealed radioactive sources, transport of radioactive materials, etc.;

44.2. workers were made aware of the procedures and instructions upon signature and are in compliance with them;

44.3. working procedures and radiation protection instructions are reviewed at least once per year and modified as necessary.

45. Workers shall:

45.1. follow any applicable rules and working procedures for radiation protection;

45.2. use properly the monitoring equipment and personal protective equipment provided;

45.3. cooperate with undertaking regarding implementation and improvement of workers' health examinations, individual monitoring and radiological surveillance of the workplace descriptions;

45.4. provide the undertaking with information on their past and present employment that is related to activities with sources for ensuring that dose limits set in Annex 6 would not be exceeded;

45.5. abstain from any wilful action that could put themselves or others in situations that would not be in accordance with the requirements of these hygiene standards;

45.6. accept training and instruction on radiation protection.

46. The worker must immediately inform the undertaking if he notices the circumstances that may cause radiation protection requirements to be violated. Upon receipt of such information, the undertaking must record it and take measures to ensure compliance with radiation protection requirements.

SECTION 2
RADIATION PROTECTION OF APPRENTICES AND STUDENTS

47. Radiation protection of apprentices and students is ensured following requirements set in [5.1] and below:

47.1. exposure conditions and radiation protection of apprentices and students aged between 16 and 18 years shall be equivalent to that of workers of category B;

47.2. exposure conditions and radiation protection of apprentices and students aged 18 years or over shall be equivalent to that of workers of category A or B as appropriate.

SECTION 3
CONSULTATIONS WITH A RADIATION PROTECTION EXPERT

48. The undertakings shall seek advice from a radiation protection expert within their areas of competence on the issues below that are relevant to the practice:

48.1. examination and testing of protective devices and measuring instruments designated to ensure radiation protection;

48.2. review of projects, for premises in which activities are planned, from the point of view of radiation protection;

48.3. the acceptance into service of new or modified sources from the point of view of radiation protection;

48.4. regular checking of the effectiveness of protective devices and techniques that are used to ensure radiation protection;

48.5. regular calibration of measuring instruments, quality control, technical maintenance and regular checking that it is serviceable and correctly used.

SECTION 4
RADIATION PROTECTION OR AIRCREW

49. The undertaking operating aircraft (flying at altitudes above 8 000 m) shall assess the annual exposure of the aircrew concerned in order prescribed by Radiation Protection Centre. If annual effective dose of aircraft crew does not exceed 1 mSv, no radiation protection measures need be applied.

50. In case the effective dose to the aircrew is liable to be above 1 mSv per year undertaking shall take appropriate measures, in particular:

50.1. assess the individual exposure of aircrew;

50.2. take into account the assessed exposure when organizing working schedules with a view to reducing the doses of highly exposed crew;

50.3. inform workers concerned of the health risks their work involves and their individual dose;

50.4. apply requirements set in para. 32 to pregnant air crew;

50.5. where the effective dose to the crew from cosmic radiation is liable to exceed 6 mSv per year, the relevant requirements set out in Chapter V shall apply.

SECTION 5
CLASSIFICATION AND CONTROL OF WORKPLACES

51. The undertaking shall designate as a controlled and supervised areas any premises or territory where workplaces are located.

52. The undertaking shall designate as controlled area any premises, parts of premises or areas in which activities are carried out, i.e. premises, parts of premises or areas where, under normal operating conditions, it is necessary or, in the event of a radiological incident or radiological emergency, it may be necessary to apply specific radiation protection measures to prevent or limit the likelihood and magnitude of occupational exposure and to prevent the spread of radioactive contamination outside the controlled area.

53. The controlled area shall be managed in accordance with the following requirements:

53.1. delineate controlled areas by physical means or, where this is not reasonably practicable, by means of markings (lines, inscriptions, etc.). When a source is only intermittently brought into operation or is moved from place to place, delineate an appropriate controlled area under the prevailing circumstances;

53.2. on the entrance to the controlled area signs specified in Lithuanian standard LST EN ISO 361 shall be displayed and additional inscription indicating the type of area shall be written in Lithuanian language and, where appropriate, language understood by workers;

53.3. access to controlled area shall be controlled in accordance with written procedures listed in paras. 34.1 and 34.2;

53.4. workers, apprentices and students, working in controlled area, shall receive appropriate instructions on radiation protection in accordance with the order laid down [5.1] and paras. 34.1 and 34.2;

53.5. workers, apprentices and students shall be provided with the appropriate personal protective equipment before entering controlled areas, if it’s required by the nature of the activities performed;

53.6. wherever there is a risk of the spread of radioactive contamination, at exits from controlled areas:

53.6.1. contamination of any objects being removed from and individuals leaving the controlled area shall be monitored;

53.6.2. showering or other personal decontamination facilities shall be in place;

53.6.3. suitable storage for contaminated items shall be in place;

53.7. individual monitoring and radiological surveillance of the workplace shall be organized.

54. The undertaking shall designate as a supervised area any area not already designated as a controlled area but for which occupational exposure conditions need to be kept under review, even though specific measures for protection and safety are not normally needed.

55. Supervised area shall be managed in accordance with the following requirements:

55.1. delineate supervised areas by means of markings (lines, inscriptions, etc.);

55.2. on the entrance to the supervised area signs specified in Lithuanian standard LST EN ISO 361 shall be displayed and additional inscription indicating the type of area shall be written in Lithuanian language and, where appropriate, language understood by workers;

55.3. radiological surveillance of the workplace shall be organized;

55.4. work in supervised area shall be performed in accordance with the instructions on radiation protection referred in paras. 34.1 and 34.2.

56. Undertaking shall ensure that working conditions, boundaries of controlled and supervised areas and radiation protection measures of controlled and supervised areas are reviewed at least once per 2 years and modified as necessary.

SECTION 6
CATEGORISATION OF WORKERS

57. The undertaking or, in the case of outside workers, the employer, shall decide on the categorisation (A or B) of workers prior to their work assignments that may give rise to exposure, and review this categorisation on the basis of working conditions, medical surveillance and potential exposures:

57.1. category A: those workers who are liable to receive an effective dose greater than 6 mSv per year or an equivalent dose greater than 15 mSv per year for the lens of the eye or greater than 150 mSv per year for skin and extremities;

57.2. category B: those workers who are not classified as category A workers.

SECTION 7
INDIVIDUAL MONITORING AND RADIOLOGICAL SURVEILLANCE OF THE WORKPLACES

58. The undertaking shall organize and carry out individual monitoring and radiological surveillance of the workplaces in accordance with the provisions of legislation on performance of individual monitoring and radiological surveillance of the workplaces, and based on the results of such monitoring, occupational exposure of the workers shall be estimated and predicted.

59. The undertaking shall ensure that individual monitoring and radiological surveillance of the workplaces measurements and (or) exposure dose evaluation is carried out only by persons, including dosimetry services, performing exposure dose and (or) dose rate and (or) activity measurements and (or) exposure dose evaluation, recognized in accordance with the provisions of [5.1].

60. Individual monitoring of workers shall be performed by carrying out individual measurements of their exposure:

60.1. for all workers of category A. In cases where category A worker is liable to receive significant internal exposure or significant exposure of the lens of the eye or extremities, the monitoring of internal exposure or exposure of the eyes, skin and (or) extremities shall be performed;

60.2. for all workers of category B for 1 year from beginning of the work with sources, in order to assure that such workers are correctly classified in category B. In the special circumstances, Competent Authority can insist, that individual monitoring of a specific worker of category B shall be performed longer than for 1 year.

61. In cases where individual measurements are not possible or inadequate for exposure evaluation, the individual monitoring shall be based on the results of the surveillance of the workplace with respect to the information on duration of workers exposure or individual measurements made on other workers with same working conditions.

62. In cases annual effective dose of the worker exceeds 100 mSv the dose received shall be verified by the biological dosimetry, except cases when exposure was received in exceptional circumstances or it's emergency occupational exposure.

63. The undertaking shall ensure, that doses received by worker due to emergency occupational exposure, such as external exposure effective doses and (or) equivalent doses (lens of the eye, skin and extremities) and (or) internal exposure committed effective dose and (or) whole body tissues and organs committed equivalent dose, is assessed.

64. The undertaking shall register the results of individual monitoring of each worker, who is subject to individual monitoring according to the provisions of paras. 60 and 61. The following information shall be registered:

64.1. data on measured or, in case described in para. 61, estimated individual doses of occupational exposure, including radon exposure, in situations where this exposure requires the practice to be authorised, emergency exposure, and exposure allowed in the special circumstances, emergency occupational exposure;

64.2. in the situations of emergency exposure, exposure allowed in the special circumstances or emergency occupational exposure – circumstances in which this exposure was received and actions taken in order to reduce this exposure;

64.3. data of radiological surveillance of the workplaces, which was used for individual dose evaluation in case such evaluation was performed.

65. In the situations of emergency exposure, exposure allowed in the special circumstances, emergency occupational exposure or radon exposure results of individual monitoring shall be recorded separately.

66. When employer send his workers to undertaking accepting outside workers, or when worker is employed of more than one employer, undertaking with respect to requirements of para. 64 shall additionally register the data on the start and end of the work with sources and the results of individual monitoring of the worker while he is working for the other undertaking.

67. When worker change undertaking, employer shall give access to information on the results of individual monitoring of the worker if being asked by undertaking.

68. Data on individual monitoring and radiological surveillance of the workplaces shall be stored:

68.1. data on radiological surveillance of the workplaces shall be stored for 5 years. Data, which are used for determination of boundaries of controlled areas, shall be stored until these boundaries are changed;

68.2. results of radiological surveillance of the workplaces, which are used for assessment of occupational effective and equivalent doses of workers and information referred in paras. 64 and 66 – during the period of their working life involving exposure to ionizing radiation and afterwards until they have or would have attained the age of 75 years, but in any case not less than 30 years after termination of the work with sources.

69. The undertaking shall:

69.1. grant workers, at their request, access to the results of their individual monitoring, including the results of measurements which may have been used in estimating these results, or to the results of the assessment of their doses made as a result of surveillance of the workplace.

69.2. provide data on exposure doses received by worker to physician, who perform annual medical surveillance.

70. The undertaking shall ensure confidentiality of individual monitoring data of the worker.

71. The undertaking shall ensure that in the case of an emergency exposure, the results of individual monitoring and dose assessments would be communicated to the individual and the regulatory body without delay, but in any case not later than 5 working days after receiving of these results.

SECTION 8
RADIATION PROTECTION OF OUTSIDE WORKERS

72. Undertaking accepting outside workers shall:

72.1. ensure compliance with [5.1] and requirements of radiation protection laid down in Sections 1–5 of Chapter IV;

72.2. make sure that outside workers of category A have passed as medically fit as required in [5.1];

72.3. check whether the categorisation of outside workers is appropriate in relation to the doses liable to be received within the undertaking;

72.4. verify that outside worker has passed radiation protection training and instructing as required in [5.1]. Make sure, that before entering the controlled areas in addition to the basic training in radiation protection outside worker has received specific instructions and training in connection with the characteristics of the workplace and the conducted activities in accordance with the requirements set out in para. 34.2 and 34.3;

72.5. make sure that outside worker has a Passbook of outside worker‘s exposure, in the form set out in Annex 7, or an equivalent document issued by the competent authority of a foreign country, no earlier than 3 months before he starts working for undertaking accepting outside workers. Do not allow outside worker to commence work if the outside worker has no Passbook of outside worker‘s exposure or equivalent document issued by a competent authority of a foreign country or it has been issued to outside worker earlier than 3 months prior starting work for undertaking accepting outside workers. It is not obligatory to have a Passbook of outside worker‘s exposure for Category B outside workers in case their individual exposure monitoring is not carried out according to requirement set out in para. 60.2 or their exposure is monitored by the employer of outside workers;

72.6. ensure that before entry into supervised areas the outside worker has received working instructions as foreseen in para. 55.4;

72.7. ensure that the outside workers have been issued with necessary personal protective equipment adequate to the type of ionising radiation, characteristics of the workplace and the conducted activities (during normal operation and in case of emergency exposure);

72.8. ensure that outside workers receive individual exposure monitoring according to the order set in legal acts on individual monitoring;

72.9. ensure that individual monitoring results of outside worker’s occupational exposure are recorded according to the procedure laid down in para. 64 and made available to the outside worker in accordance with para. 69.1 and upon termination of employment of outside worker recorded in Passbook of outside worker‘s exposure;

72.10. upon termination of outside worker’s employment return filled Passbook of outside worker‘s exposure or, in case outside worker is an employee of foreign company, filled Passbook of outside worker‘s exposure or equivalent document issued by a competent authority of a foreign country to employer of outside worker within 10 days after the end of work.

73. Employer of outside workers either directly or through contractual agreement with the undertaking accepting outside workers shall:

73.1. ensure compliance with [5.1] and requirements of radiation protection laid down in Sections 1–5 of Chapter IV;

73.2. ensure radiation protection training and instruction of outside workers as defined in paras. 33, 35 and 34.1;

73.3. guarantee that outside workers are subject to appropriate assessment of exposure as defined in section 7 of Chapter V and, for category A workers, medical surveillance is carried out under the conditions laid down in [5.1];

74. Employer of outside workers shall:

74.1. prior to the commencement of work, apply to Radiation Protection Centre in order to obtain Passbook of outside worker‘s exposure for outside worker, whose individual doses are or must be registered in the State Register of Sources of Ionizing Radiation and Occupational Exposure administered by Radiation Protection Centre and provide the following data:

74.1.1. information about outside worker specified by order of the Minister of Health Care;

74.1.2. A category outside worker‘s mandatory health examination date and result, title of Personal Health Care Institution which carried out the examination;

74.1.3. title, unique identification number, address, telephone number and email of the employer of outside worker;

74.2. upon termination of outside worker’s employment after receiving Passbook of outside worker‘s exposure from undertaking accepting outside worker familiarize outside worker with his individual doses and sent back Passbook of outside worker‘s exposure to Radiation Protection Centre within 10 days after the end of outside workers work;

74.3. If the outside worker didn‘t start the work in 3 months after the issuance of Passbook of outside worker‘s exposure, this document has to be sent back to the Radiation Protection Centre.

75. Outside worker shall:

75.1. cooperate with undertaking accepting outside workers and radiation protection officer, also with undertaking accepting outside workers or employer of outside workers upon fulfilling the requirements set in paras. 72, 73 and 74, contribute to and improve the radiation protection program;

75.2. perform duties listed in para. 43 and 46.

76. Only one Passbook of outside worker‘s exposure may be issued to outside worker at a time. In case there are two or more employers of outside worker performing work in controlled and supervised zone of undertaking accepting outside workers, all doses received by that worker must be recorded in the same Passbook of outside worker‘s exposure.

SECTION 9
SPECIALLY AUTHORISED EXPOSURES

77. In exceptional circumstances evaluated case by case, excluding emergencies, the regulatory body may authorize individual occupational exposures of identified workers exceeding the dose limits set out in Annex 6, provided that such exposures are limited in time, confined to certain working areas and within the maximum exposure levels defined for the particular case by the regulatory body.

78. Apprentices, students, pregnant workers, and, if there is a risk of intake or bodily contamination, breastfeeding workers are excluded from specially authorized exposures.

79. In exceptional circumstances permitting identified worker to exceed the dose limits the following conditions shall be taken into account:

79.1. only category A workers or spacecraft crew may be subject to such exposures;

79.2. undertaking justified such exposures in advance and thoroughly discussed them with the worker, his representative (if there is such), practitioner performing mandatory health examination and the radiation protection expert;

79.3. undertaking informed relevant workers in advance about the radiation risks and precautionary radiation protection measures to be taken;

79.4. the workers gave their consent to work in writing;

79.5. doses received would be recorded as referred in para. 64 and [5.1] and submitted to practitioner performing mandatory health examination.

80. The exceeding of dose limits as a result of specially authorized exposures shall not necessarily constitute a reason for excluding workers from their usual occupation or relocating them, without their agreement.

81. For crew members exposed in excess of the occupational exposure limits set out in Annex 6 the requirements of paras. 77–80 shall be applied.

SECTION 10
EMERGENCY OCCUPATIONAL EXPOSURE

82. The undertaking and civil protection system forces are responsible for emergency occupational exposure of emergency workers.

83. The undertaking and civil protection system forces shall ensure that emergency occupational exposure remains, with the exception mentioned in para. 84, below the dose limits for workers, laid down in Annex 6.

84. For situations where it is not feasible to ensure that the doses of emergency workers do not exceed the dose limits for workers, laid down in Annex 6, reference levels for emergency occupational exposure shall be set and the following conditions shall apply:

84.1. with the aim to avoid high collective doses reference levels for emergency occupational exposure shall be set below an effective dose of 100 mSv;

84.2. a reference level for an effective dose from external radiation of emergency workers may be set above 100 mSv, but not exceeding 500 mSv, in order to:

84.2.1. save human life and (or) prevent severe radiation-induced human health effects;

84.2.2. to prevent the occurrence of severe deterministic effects caused by ionizing radiation;

84.2.3. to avoid catastrophic conditions of emergency situation.

85. The undertaking and civil protection system forces shall ensure that:

85.1. training and instruction of emergency workers in radiation protection is carried out in accordance with order set in [5.1]. Emergency workers who are liable to be assigned to undertake emergency response work which could cause that reference level for an effective dose of 100 mSv may be exceeded shall be additionally informed in advance of the associated health risks and available radiation protection measures and undertake these actions voluntarily;

85.2. knowledge and skills of emergency workers are tested during exercises as prescribed in [5.7];

85.3. mandatory medical examination of emergency workers is carried out in consistency with [5.1] and, if necessary, their decontamination, periodic medical examinations and psychological counselling are organized;

85.4. emergency workers not designated in advance and helpers in an emergency immediately before the conduct of their specified duties are provided with instructions on how to perform their duties under emergency conditions;

85.5. emergency workers are provided with specialized protective equipment;

85.6. individual monitoring of emergency workers is carried out considering the nature of the emergency response work;

85.7. in case exposure due to radioactive iodine is possible, iodine thyroid blocking, as appropriate, is provided.

SECTION 11
RADON IN WORKPLACES

86. The reference level for the annual average activity concentration of radon in air of premises at workplace is 300 Bq/m^3.

87. Employers of the workplaces, where radon risk was identified by Radiation Protection Centre or in case workplaces are within the radon risk areas identified in accordance with para. 166 and are located underground, in basement, semi basement or on the ground floor of buildings, must:

87.1. to carry out radon measurements at least once in 5 years and inform employees on the results;

87.2. to inform the regulatory body immediately if the average annual concentration of radon in air of premises exceeds the reference level referred to in para. 86 and assess the exposure of the employees at each workplace, taking into account the duration of time spent at the workplace;

87.3. in cases where the annual effective dose of a employee exceeds 6 mSv, within one calendar year from the date of the determination of the annual effective dose exceedance, to implement radon remedial measures for optimization of radiation protection in the workplace;

87.4. assess the exposure of the employee at least once a year, at the workplace where the reference level specified in para. 86 was exceeded and where the annual effective dose of the employee is less than or equal to 6 mSv, depending on duration of time spend at that workplace.

88. In cases where the employee's exposure exceeds 6 mSv in the workplace, irrespective of the remedial measures taken for the reduction of radon, the employer must authorise the practice in accordance with [5.1].

CHAPTER VI
MEDICAL EXPOSURE

SECTION 1
JUSTIFICATION

89. Net benefit of medical exposure for an individual and society, taking into account the total potential diagnostic and treatment benefit, shall be higher than individual detriment that the exposure might cause, taking into account available alternative techniques (the efficacy, benefits and risks) involving no or less exposure to ionising radiation.

90. Each individual medical exposure applied to a person shall be justified in advance taking into account the specific objectives of the exposure and the characteristics of the individual involved.

91. In case a type of practice involving medical exposure is not justified in general, but for a specific individual exposure of this type in special circumstances can be justified, justification of this exposure shall be evaluated on a case-by-case basis and documented in appropriate documents.

92. Medical exposure shall be applied only in case it has been requested by a referring medical practitioner.

93. The referrer and the practitioner seeking to avoid unnecessary exposure, where it is possible, shall try to obtain previous diagnostic information or medical records relevant for medical exposure application and take into account these data.

94. The medical exposure of careers and comforters show a sufficient net benefit, taking into account the direct health benefits to a patient, the possible benefits to the career and comforter and the detriment that the medical exposure might cause.

95. Any medical radiological procedure on an asymptomatic individual, to be performed for the early detection of disease, shall be part of a health screening programme, or requires specific documented justification for that individual by the practitioner, in consultation with the referrer, in accordance with requirements set in the order of the Minister of Health and relevant medical scientific societies. Individual involved in such medical exposure shall be informed as referred in para. 100.

SECTION 2
RADIATION PROTECTION OPTIMISATION

96. Radiation protection optimisation shall take into account economic and societal factors. Radiation protection optimisation shall include:

96.1. the selection of medical radiological equipment;

96.2. the production of adequate diagnostic information or therapeutic outcomes;

96.3. the practical aspects of medical radiological procedures;

96.4. quality assurance including quality control;

96.5. the assessment and evaluation of patient doses or the verification of administered activities.

97. The undertaking shall ensure that:

97.1. the practitioners, the medical physics specialists or experts and specialists referred in para. 101 shall be involved in the optimisation process;

97.2. the practitioners and specialists referred in para. 101 shall use diagnostic reference levels for radiodiagnostic examinations and interventional radiology procedures approved by Minister of Health, and recommendations for their application prepared by Radiation Protection Centre;

97.3. doses due to medical exposure for radiodiagnostic, interventional radiology, planning, guiding and verification purposes are kept as low as reasonably achievable consistent with obtaining the required medical information;

97.4. exposures of target volumes for radiotherapeutic purposes shall be individually planned 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.

97.5. there are instructions for careers and comforters prepared, describing their behavior during medical radiological procedures and after radiodiagnostic and therapeutic procedures with radiopharmaceuticals. These instructions shall be prepared taking into account particular circumstances and foreseen all possible situations that careers and comforters could get in;

97.6. in the case of a patient undergoing treatment or diagnosis with radiopharmaceuticals the patient or their representative are provided with appropriate instructions how to restrict doses to persons in contact with the patient and information on the risks of ionising radiation. For diagnostic procedures when radionuclides with half lifetime more than 6 hours are being used and therapeutic procedures such instructions shall be written and handed out before patient leave the healthcare institution;

98. The undertaking performing biomedical research project shall ensure that:

98.1. the individuals approve their participation in such project in writing voluntary. If individual are under-age approval shall be signed by their representatives;

98.2. individuals or representatives are informed in writing about the risks of ionising radiation;

98.3. in the case patients voluntarily agree to undergo an experimental medical practice and it is expected to receive a diagnostic or therapeutic benefit from this practice, the dose levels concerned shall be considered on an individual basis by the practitioner and/or referrer prior to the exposure taking place;

98.4. recommendations of Helsinki declaration and National Medical Research council and world Health Organization are being taken into account.

SECTION 3
RESPONSIBILITIES

99. In the justification process of individual medical exposures, according competence the referrer and the practitioner shall be involved.

100. Prior to the medical exposure taking place, when it is possible, the practitioner or the referrer shall ensure that the patient or their representative is provided with adequate information about medical exposures benefits and risks associated with the radiation dose. The same information and instructions as referred in para. 97.5 shall be given to careers and comforters.

101. The undertaking or practitioner implementation of practical aspects of medical radiological procedures may delegate to one or more specialists (radiology technologists, medical physicists, individuals providing technical service and etc.) entitled to act in this respect according competence.

SECTION 4
TRAINING

102. The undertaking must ensure that practitioners, medical physicists experts, medical physicists specialists and specialists as referred in para. 101 have adequate professional education, theoretical and practical training in medical radiological practices, as well are trained in radiation protection according requirements of [5.1.] and have proper conditions for continuing education and training to improve professional qualification.

103. Specialists as referred in para. 101, during trainings according appropriate curricula, can participate in implementation of the practical aspects of medical radiological procedures.

SECTION 5
MEDICAL RADIOLOGICAL PROCEDURES

104. The undertaking shall ensure that:

104.1. written protocols for every type of standard medical radiological procedure are established for each equipment used to perform these procedures for relevant categories of patients (adults, children, pregnant woman and etc.);

104.2. patients report of the medical radiological procedure include information relating to patient exposure dose or injected radiopharmaceutical activity or other information related to patient exposure;

104.3. medical physics expert participates in medical radiological practice. His participation shall be proportional to risk of medical exposure:

104.3.1. medical physics expert shall be closely involved in radiotherapeutic procedures except standardized therapeutic nuclear medicine procedures;

104.3.2. medical physics expert shall be involved in standardised therapeutical nuclear medicine procedures as well as in radiodiagnostic and interventional radiology procedures, involving high doses as referred to para. 104.5.3;

104.3.3. medical physics expert shall be involved, as appropriate, for consultation and advice on matters relating to radiation protection, as well as patient dosimetry and quality assurance (including quality control) and other matters associated with radiation protection, performing medical radiological procedures not referred to hygiene standard paras. 104.3.1 and 104.3.2;

104.4. external clinical audits are being carried out at least once per 5 years in accordance with the procedure established by the Minister of Health;

104.5. appropriate medical radiological equipment and ancillary equipment as well as medical procedures descriptions are used when medical exposure is applied:

104.5.1. to children;

104.5.2. as part of a health screening program;

104.5.3. during medical radiological procedures, when patients' exposures are relatively high, as in interventional radiology, nuclear medicine, computed tomography or radiotherapy;

104.6. special attention is given to quality assurance programs and the assessment of dose or verification of administered activity for practices referred in para. 104.5;

104.7. fluorography equipment shall not be used:

104.7.1. for children diagnostic procedures;

104.7.2. for radiodiagnostic from 2020 January 1st.

105. The practitioners and other specialists referred in para. 101, carrying out medical radiological procedures referred in para. 104.5, shall have appropriate training;

106. With the introduction of new medical radiological procedures or new equipment practitioners and other specialists referred in para. 101, shall be trained to work according these procedures and to use new equipment, as well as be introduced with radiation protection requirements applied to these procedures and equipment.

107. The undertaking must:

107.1. keep records necessary for retrospective dose assessment of individuals exposed by medical exposure and determine if used equipment worked properly. This information shall be saved for 10 years;

107.2. carry out assessment of patients doses exposed during radiadiagnostic procedures (in nuclear medicine – administered activity) and take means to ensure that average dose of standard patient does not exceed diagnostic reference levels approved by Minister of Health, applied to radiodiagnostic and interventional radiology procedures. If average dose of group of more than 20 patients is higher than diagnostic reference levels approved by Minister of Health the causes shall be investigated and corrective action shall be taken without undue delay.

108. Registered patient exposure data and assessment of patient exposure doses as well as results of this assessment, as specified in para. 107.2, shall be sent for evaluation of average dose of different patients groups according order approved by Radiation Protection Centre.

SECTION 6
MEDICAL RADIOLOGICAL EQUIPMENT

109. The undertaking must ensure that:

109.1. all medical radiological equipment in use is kept under surveillance regarding radiation protection requirements, concerning to appropriate standards, radiation protection requirements and manufacturer recommendations;

109.2. acceptance testing is carried out before the first use of the equipment for medical radiological procedures, and quality control tests are carried out thereafter on a regular basis. Quality control tests shall be carried out after any maintenance procedure liable to affect the patients and workers exposure or usage of this equipment.

110. Medical radiological equipment have to satisfy these requirements:

110.1. follow the International Elektrotechnical Commission (IEC), International Standards Organization (ISO) and Lithuanian standards;

110.2. technical documents shall be prepared according The International Elektrotechnical Commission (IEC), International Standards Organization (ISO) and Lithuanian standards requirements set for accompanying documents, and user manuals and radiation protection instructions shall be prepared in Lithuania language;

110.3. fluoroscopy equipment shall have automatic dose rate control device and image intensifier or equivalent device;

110.4. radiation therapy equipment with ionising radiation nominal energy above 1 MeV, shall have device for validating main treatment parameters. This requirement is not applied for equipment mounted until September 1st, 2018;

110.5. interventional radiology equipment shall have device or function that shows information about ionising radiation exposure amount released during procedure for practitioner or other specialists referred in para. 101. This requirement is not applied for equipment mounted until September 1st, 2018;

110.6. interventional radiology and computer tomography equipment and any other new equipment used for purposes of planning, control and validation, shall have device or function, that shows information about parameters necessary for patient dose evaluation for practitioner;

110.7. interventional radiology and computer tomography equipment shall have possibility to register information referred in para. 110.6. This requirement is not applied for equipment mounted until September 1st, 2018;

110.8. in addition to requirements set in para. 110.5–110.7 new radiation diagnostic equipment shall have device or equivalent device, enabling practitioner gain information about parameters for patient doses assessment. In case it is impossible, new radiation diagnostic equipment shall have possibility to register this information in medical radiological exposure report;

110.9. conditions of use of the equipment, parameters and their abbreviations written on equipment control panel shall be in Lithuanian and if necessary, in other language understandable to specialists.

111. The undertaking must prepare and apply quality assurance programs that include:

111.1. description of the procedure concerning evaluation and registration of doses or administered activity of individuals exposed with medical exposure;

111.2. description of the procedure concerning accounting and registration of parameters of medical radiological procedures and their results;

111.3. description of the procedure concerning calibration and use of equipment for patients doses monitoring;

111.4. quality control measures;

111.5. medical radiological equipment acceptability criterions and measures necessary to take when equipment does not meet these criterions;

111.6. requirements for worker professional qualification and description of the procedure concerning improvement of worker professional qualification;

111.7. description on quality assurance programme audits process.

112. In case it's identified, that medical radiological equipment characteristics do not meet criterions approved by Minister of Health, the undertaking must take measures to remove discrepancies to these criterions. The undertaking must use medical radiological equipment in such a way that characteristics of a equipment, that do not meet criterions, do not influence patients doses received for diagnostic and treatment purposes. Otherwise such equipment must be not used. In case medical radiological equipment discrepancy cannot be eliminated immediately and they are not able to cause accident or incident exposure, medical radiological equipment can be used if the undertaking has prepared a plan for elimination of these discrepancies and submitted it to Radiation Protection Centre within 5 working days after identification of discrepancy.

SECTION 7
RADIATION PROTECTION OF PREGNANT AND BREASTFEEDING WOMAN

113. The undertaking must ensure that:

113.1. the referrer and the practitioner shall ask whether a woman of childbearing age is pregnant before medical radiological exposure and in case radiopharmaceuticals are used for diagnostic procedure or treatment – is she pregnant or breastfeeding;

113.2. when it is unclear if woman is not pregnant medical radiological procedures shall be delayed until pregnancy shall be ruled out, except situations when procedure cannot be delayed due to clinical reasons;

113.3. special attention shall be given to radiation protection of pregnant woman and unborn child in case medical radiological procedure cannot be delayed and in particular if abdominal and pelvic regions are involved;

113.4. special attention shall be given to optimisation of radiation protection of breastfeeding woman and child in case diagnostic or treatment procedure with radiopharmaceuticals cannot be delayed for breastfeeding woman;

114. The undertaking, without prejudice to paras. 113.1, 113.2 and 113.3, must use different informative means (public notices, pictures and posters) helping to identify circumstances referred to paragraph 113.1.

SECTION 8
ACCIDENTAL AND UNINTENDED EXPOSURES

115. The undertaking shall take all reasonable means to minimize probability of accidental or unintended exposure to individuals undergoing medical expose as much as possible and individuals' exposures due to these events.

116. The cases of accidental and unintended exposures are as follows:

116.1. medical radiological procedure delivered to the wrong individual or to the wrong tissue or organ of the patient;

116.2. using of wrong radiopharmaceutical or wrong activity of the radiopharmaceutical, or dose or dose fractionation for the patient differing substantially from (over or under) the values prescribed by the radiological medical practitioner;

116.3. inadvertent exposure of the embryo or fetus in the course of performing a medical radiological procedure;

116.4. any failure of medical radiological equipment, failure of software or human mistake causing overexposure of the patient.

117. The undertaking must ensure that:

117.1. for radiotherapeutic practices the quality assurance programme includes a study of the risk of accidental or unintended exposures;

117.2. events involving or potentially involving accidental or unintended medical exposures are registered and analyzed.

118. The undertaking after identification of accidental or unintended medical exposure event must:

118.1. estimate the doses received and the dose distribution within the whole patient body and separate body parts;

118.2. implement the corrective actions in order to avoid accidental or unintended exposures events;

118.3. ensure that the referrer, the practitioner, the patient or his representative are informed about potential effect of the unintended or accidental medical exposure and reasons of the exposure;

118.4. promptly, but not later than 2 days after the event, notify Radiation Protection Centre;

118.5. prepare analysis report on unintended or accidental medical exposure containing the cause of this exposure, consequences, information referred in paras. 118.1 and 118.2 and other important information and submit this written report to Radiation Protection Centre in 10 working days after unintended or accidental medical exposure event registration.

119. Information, relevant to radiation protection concerned with experience on the unintended or accidental events, shall be timely submitted to Radiation Protection Centre, competent authorities and other interested parties.

SECTION 9
MEDICAL PHYSICS EXPERT

120. Medical physics expert shall apply radiation physics knowledge and consult on matters relating to radiation physics while implementing requirements referred in Chapter VI and performing nonmedical diagnostic procedures with medical radiological equipment.

121. Medical physics expert, depending on medical radiological field, takes responsibility for dosimetry, including measurements for evaluation of the dose delivered to the patient and other individuals subject to medical exposure and give advice on medical radiological equipment. Medical physics expert contribute in these activities:

121.1. optimisation of the radiation protection of patients and other individuals subject to medical exposure, including the application of medical radiological and use of diagnostic reference levels;

121.2. preparation and implementation of quality assurance programs related to medical radiological equipment;

121.3. performing acceptance testing of medical radiological equipment;

121.4. preparation of technical specifications for medical radiological equipment and building design related to radiation protection;

121.5. performing the surveillance of the medical radiological equipment;

121.6. the analysis of accidental or unintended exposure events or such events that potentially might happen;

121.7. the selection of equipment to perform radiation protection measurements;

121.8. the training of practitioners and other staff in relevant aspects of radiation protection.

122. The medical physics expert shall liaise with the radiation protection expert.

CHAPTER VII
EXPOSURE OF HUMANS FOR NON-MEDICAL IMAGING PURPOSES

SECTION 1
NON-MEDICAL IMAGING EXPOSURE PROCEDURES

123. List of practices involving non-medical imaging exposure is laid down in Annex 8.

124. Persons or the undertaking intending to carry out a practice involving non-medical imaging exposure procedures must apply for the authorization in accordance with [5.1].

125. Non-medical imaging exposure procedures are divided into:

125.1. non-medical imaging exposure procedures using medical radiological equipment;

125.2. non-medical imaging exposure procedures using other than medical radiological equipment.

SECTION 2
JUSTIFICATION OF PRACTICES INVOLVING NON-MEDICAL IMAGING EXPOSURE

126. Person or the undertaking planning to carry out a practice involving non-medical imaging exposure must prepare a Description of the Non-Medical Imaging Exposure Procedure, also indicating the need to carry out non-medical imaging exposure procedure.

127. Radiation Protection Centre, taking into account the information received on methods and technologies that are safer from the point of view of radiation protection, and having determined that practices involving non-medical imaging exposure procedures are unjustified shall withdraw such practices from the List of Justified Practices with Radiation Sources, Excluding Practices with Radiation Sources in the Area of Nuclear Energy.

128. The undertaking shall justify in advance all individual non-medical imaging exposure procedures using medical radiological equipment, taking into account the specific objectives of the procedure and the characteristics of the individual involved (sex, weight, age, etc.).

129. At least once in 3 years Radiation Protection Centre shall review the circumstances of performing non-medical imaging exposure procedures that are not individually justified for each individual and upon determining that the circumstances of such procedures have changed, decide whether performance of non-medical imaging exposure procedures that are not individually justified are reasonable.

SECTION 3
PERFORMING NON-MEDICAL IMAGING EXPOSURE PROCEDURES

130. The undertaking carrying out the practices involving non-medical imaging exposure, listed in para. 1 of Annex 8 must ensure that:

130.1. the practitioner decides on the justification of each non-medical imaging exposure procedure after evaluation whether or not there is an alternative way of performing the procedure without the use of ionizing radiation;

130.2. upon performing non-medical imaging exposure procedures:

130.2.1. relevant requirements identified for medical exposure set out in Chapter VI are applied;

130.2.2. specifically prepared non-medical imaging exposure procedure protocols, consistent with the deliberate exposure of individuals and required image quality, are used;

130.2.3. whenever possible, specific diagnostic reference levels are applied for certain medical radiological procedures;

130.3. non-medical imaging exposure procedures are recorded. The following information is recorded: examined individual's name and surname, title of examination, name and surname of the person giving consent, contact details and relation to examined individual, name and surname of the practitioner who has performed examination and any data that could be used to calculate the effective dose of the individual.

131. Performing practices introduced in para. 130, involving non-medical imaging exposure procedures, dose limits for public exposure set in Annex 6 shall not be applied.

132. The undertaking carrying out the practices involving non-medical imaging exposure, introduced in para. 130, must provide to Radiation Protection Centre information on the number and titles of the non-medical imaging exposure procedures performed in the past year until 1st of March of every year.

133. Performing non-medical imaging exposure procedures using medical radiological equipment with radioscopy equipment without an electronic image intensifier or fluorography equipment is prohibited.

134. Performing practice of non-medical imaging exposure procedures, listed in para. 2.1 of Annex 8, it is prohibited:

134.1. to carry out mass screening of people, except the cases determined by the Government of the Republic of Lithuania;

134.2. to scan children under 16 years old and pregnant women;

134.3. to use through-body x-ray security scanners;

135. The undertaking carrying out the practices involving non-medical imaging exposure, listed in para. 2.1 of Annex 8 must ensure that:

135.1. individuals selected for the scan are provided with the information on the ionising radiation used, the effective dose they are about to receive, available alternative check methods and the possibility to refuse the procedure, unless the legislation specifies otherwise;

135.2. effective dose constraint for scanned individuals shall not exceed 0,25 mSv a year and 0,4 μSv per scan;

135.3. suspecting the drugs concealed within the body, non-medical imaging exposure procedure shall be performed in a Health Care Institution in accordance with the requirements of para. 130.

136. Scanning equipment used while carrying out the practices listed in para. 2.1 of Annex 8 shall:

136.1. comply with the requirements of international standard IEC 62463 and be marked with the CE mark and have the supporting documents;

136.2. operate on the backscatter x-ray imaging technology;

136.3. have a device for recording the dose of ionizing radiation. In the absence of such a device, individual effective dose shall be calculated in accordance with the manufacture‘s prescribed method.

137. The undertaking carrying out the practices, listed in para. 2.1 of Annex 8, must provide information to Radiation Protection Centre on the number of scans performed during the past year until 1st of March of every year. Where more than one scanning device is used, this information shall be provided for each scanning device separately.

138. The undertaking carrying out the practices involving non-medical imaging exposure, listed in para. 2.2 of Annex 8 must ensure that:

138.1. radiation protection of vehicle drivers, passengers or individuals accompanying the cargo is assured;

138.2. prior to the start of scan of a vehicle or transport container, any individuals potentially hidden in the vehicle or transport container are alerted about the planned scan;

138.3. effective dose constraint for scanned individuals do not exceed 0,01 mSv per scan;

138.4. procedures for the assessment of exposure dose of exposed individuals are prepared and all data needed for the exposure assessment is recorded;

138.5. in case any individuals detected during scanning of vehicle or transport container Radiation Protection Centre is informed immediately, providing information on the circumstances of the incident, the number of individuals exposed and their exposure doses.

CHAPTER VIII
PUBLIC EXPOSURE

SECTION 1
OPERATIONAL PROTECTION OF MEMBERS OF THE PUBLIC

139. The undertaking planning to carry out practice for which a license is required or a license holder planning to expand his activities (using new sources, manufacture of the sources, etc.), taking into account the nature of the practice, sources and their potential ionizing radiation exposure and possible discharges of radioactive material to the environment must:

139.1. perform examination of the proposed siting of the facility taking into account demographic, meteorological, geological, hydrogeological and ecological conditions regarding requirements set in [5.4] and [5.6], in case when the facility is a nuclear installation – regarding requirements set in [5.3];

139.2. prepare the design of the facility or its part related to radiation protection regarding requirements set in [5.4] and to perform radiation protection (special) expertise except for nuclear installation facility in accordance with the procedure established by the Radiation Protection Centre;

139.3. prepare the approval of the facility or its part regarding requirements set in [5.4], in case when the facility is a nuclear installation – regarding requirements set in [5.3];

139.4. implement measures to control the access of members of the public to the facilities or its parts or territories where the source is located;

139.5. prepare and submit for approval a plan for discharges of radioactive materials to the environment in accordance with the procedure established by the Minister of Health except discharges of radionuclides from nuclear installations. The preparation and approval of the plan for discharges of radioactive materials to the environment from nuclear installations is performed in accordance with the procedure established in [5.3].

140. The undertaking planning to carry out practice for which a registration is required or the undertaking that carries out registered practice, when planning to expand his activities (using new sources, manufacture of the sources, etc.), taking into account the nature of activities, radiation sources and their potential ionizing radiation exposure shall implement measures required in paras. 139.2–139.4.

141. The undertaking shall ensure that the following requirements apply to members of the public visiting the controlled and (or) supervised areas:

141.1. control the access of members of the public to the controlled and (or) supervised areas;

141.2. members of the public are instructed in radiation protection before entering the controlled and (or) supervised area;

141.3. members of the public in the controlled area are accompanied by person appointed by authorised person who is familiar with the radiation protection instructions and with the description of the procedures for control of compliance with regulations applicable in that area.

SECTION 2
ESTIMATION OF DOSES TO THE MEMBERS OF THE PUBLIC AND MONITORING OF DISCHARGES OF RADIOACTIVE EFFLUENTS TO THE ENVIRONMENT

142. The undertaking planning to carry out practice for which a license is required or license holder planning to expand his activities (use of new radionuclides, to increase activity of radionuclides used in practice, to change the pathways of discharge of radioactive materials to the environment, etc.) causing the radioactive effluents to be discharged to the environment and taking into account the potential ionizing radiation exposure shall:

142.1. assess the doses of the members of the public received due to practice. The exposure of the members of the public shall be assessed on the basis of the exposure dose (s) calculated for the representative person(s). The assessment of doses received by the members of the public shall be carried out in accordance with the procedure established by the Minister of Health and, in the case of nuclear facility, according to [5.3];

142.2. carry out monitoring of radioactive effluents discharged to the environment and report to the regulatory body in accordance with the procedure established by the Minister of Health and, in the case of nuclear facility, according to [5.3];

142.3. ensure that the dose constrains for the members of the public are not exceeded;

142.4. accept into service adequate equipment and procedures for measuring and assessing exposure of members of the public and radioactive contamination of the environment

142.5. ensure that the equipment referred to in para. 142.4 is calibrated, used and checked in accordance with the manufacturer's operating instructions and technical maintenance requirements

142.6. consult with a radiation protection expert on the implementation of the requirements of para. 142.1-142.5.

SECTION 3
EMERGENCY RESPONSE

143. In order to protect the members of the public, in the event of an emergency, the undertaking shall:

143.1. immediately notify the competent authority and other institutions specified in the emergency response plan and take all appropriate measures to mitigate the consequences of an emergency. The notification shall include the following information:

143.1.1. existing and projected development of an emergency;

143.1.2. taken protective measures for the emergency workers and the members of the public;

143.1.3. planned exposure of the members of the public;

143.2. make an initial assessment of the circumstances and consequences of the emergency, take mitigatory actions and if necessary, assist the competent authorities in taking protective actions.

144. While taking protective actions, protective measures shall be predetermined:

144.1. that reduce or stop ionizing radiation emitted by a source and the release of radionuclides into the environment;

144.2. that reduce a radioactive contamination of the environment and exposure related to the individuals resulting from radioactive substances through relevant pathways;

144.3. that reduce exposure to the individuals.

145. The undertaking, in the event of an emergency within its premises or territory, is responsible for the organization of the medical treatment of the affected workers, emergency workers and other employees, patients and the members of the public in those premises or territory. In a case emergency response in the premises or territory of the undertaking is done by civil protection system forces, the organization of the medical treatment for emergency workers, of those forces, affected while responding to the emergency, is a responsibility of the civil protection system forces.

SECTION 4
INFORMATION TO THE MEMBERS OF THE PUBLIC LIKELY TO BE AFFECTED IN THE EVENT OF AN EMERGENCY

146. The members of the public likely to be affected in the event of an emergency are given prior information, in accordance with [5.5]. The information supplied shall be communicated to the members of the public without any request being made and shall include:

146.1. basic facts about ionizing radiation and its health risks involved and effect on the environment;

146.2. description of possible emergencies and its consequences for the members of the public and the environment;

146.3. measures envisaged to warn, protect and assist the members of the public in the event of an emergency;

146.4. actions to be taken by the members of the public in the event of an emergency.

147. The information, referred in para. 146, shall be permanently available, updated and distributed at regular intervals, at least once every 3 years; and whenever significant changes take place in the practice or regulatory framework.

SECTION 5
WARNING AND INFORMING THE MEMBERS OF THE PUBLIC ACTUALLY AFFECTED IN THE EVENT OF AN EMERGENCY

148. When an emergency occurs the members of the public actually affected shall be warned and informed without delay about the protective actions to be taken and, as appropriate, the health protection measures applicable to these members of the public, in accordance with [5.5]. Information to the members of the public shall be provided taking into account the hazard for health of emergency.

149. The members of the public shall receive rapidly and regularly:

149.1. information on the emergency and, if possible, its characteristics (e.g. origin, extent and probable development);

149.2. recommendations to take protective actions, depending on the type of an emergency, may contain:

149.2.1. restrictions on certain food and water consumption likely to be contaminated with radioactive materials, simple rules on personal hygiene and decontamination, recommendations to stay indoors, arrangements on iodine thyroid blocking and evacuation and etc.;

149.2.2. special warnings for certain groups of the general public (pregnant women, children and etc.);

149.3. requests to cooperate with instructions or directions by the competent authority.

150. When a warning precedes an emergency, the members of the public likely to be affected in the event of an emergency shall receive information on the possible emergency and recommendations, such as:

150.1. tune in to state radio or television, follow the information on the official websites of competent authorities and etc.;

150.2. to be prepared to take actions foreseen for specific communities and non-governmental organizations in the event of an emergency;

150.3. to be prepared to take actions foreseen for occupational groups (social workers, drivers, teachers, etc.) likely to be affected by the emergency in the event of an emergency;

151. Information and recommendations, referred in paras. 149 and 150, shall be supplemented, if possible, by a reminder to the members of the public of the basic facts about ionizing radiation and its potential health risk and effect on the environment.

SECTION 6
PREPAREDNESS TO MANAGE EMERGENCY EXPOSURE SITUATION

152. While preparing to manage emergency exposure situations the possibility of occurrence of emergencies in the territory of the Republic of Lithuania as well as outside its territory should be taken into account.

153. National and municipality level emergency plans, prepared in accordance with [5.5], and the emergency plan of the undertaking, taking into account hazard of emergency exposure situation and hazard assessment results, also have to include:

153.1. assessment of potential emergency exposure situations and assessment of public exposure and emergency occupational exposure of emergency workers due to these exposure situations;

153.2. reference levels of the public exposure, depended upon the reference levels of the public exposure, referred in Annex 5;

153.3. reference levels for emergency occupational exposure, referred in para. 84;

153.4. description of protective actions to be taken by the members of the public which may be exposed in different possible emergencies scenarios and postulated events;

153.5. arrangements for involvement and instruction on the radiation protection of the members of the public that volunteer to undertake emergency response actions, taking into account, that they cannot take actions, during which the effective dose of 50 mSv would be exceeded;

153.6. provision of the members of the public that volunteer to undertake emergency response actions with personal protective equipment and individual exposure monitoring devices;

153.7. generic criteria for particular protective actions (precautionary urgent, urgent, early and emergency response actions and other);

153.8. operational intervention levels;

153.9. reference levels for transition from an emergency exposure situation to the existing exposure situation, description of recovery and long term actions;

153.10. description of implementation of precautionary urgent and urgent protective actions;

153.11. description of assessment of the effectiveness and implementation of the arrangement to take protective actions, taking into account the specific emergency;

153.12. members of the public and emergency workers whose doses exceeds the reference levels, comparing the received doses against the applicable reference levels;

153.13. taking further protection actions, based on prevailing emergency and available information.

154. Emergency response plans, referred in para. 153, shall be reviewed, tested and, as appropriate, revised not less than once per year, taking into account the experience, that resulted from emergency exercises at the undertaking, municipality, national and international level, also lessons learned from past emergency response and changes in requirements of legal acts.

155. Emergency response plans, referred in para. 153, shall specify the procedures for updating of information, referred in paras. 153.2–153.4 and 153.7–153.8, taking in to account the progress of the emergency.

156. The undertaking, carrying out practice with stationary high-activity sealed sources, shall provide information to the territorial police headquarters, the fire and rescue board and the nearest ambulance station of the county, in which territory the practice with stationary high-activity sealed sources is carried out, within 10 working days of the date of approval of the emergency management plan, about:

156.1. each unit carrying out practice with stationary high-activity sealed sources (address, title and brief description of the practice);

156.2. possible emergencies and their description;

156.3. measures to maintain communication with the police headquarters, the fire and rescue board and the nearest ambulance station (telephone and fax numbers, e-mail addresses, also telephone and fax numbers, e-mail addresses (during working hours, rest days and holidays) of the manager and person responsible for informing the services in the event of an emergency).

157. The undertaking carrying out practice with stationary high-activity sealed sources in case of any changes of data, referred in para. 156, shall immediately provide updated data to the police headquarters, the fire and rescue board and the nearest ambulance station.

158. The police headquarters, the fire and rescue board and the nearest ambulance station shall, upon receipt of the information, referred in para. 156, notify the undertaking that provided the information within 5 working days of the receipt of this information and, if necessary, shall request the undertaking, to submit additional information.

SECTION 7
CONSUMER PRODUCTS

159. The undertaking designing, manufacturing, assembling, selling, importing or exporting consumer products must ensure that only consumer products meeting both of the following conditions are placed on the market:

159.1. justification of use of consumer products has been approved in accordance with [5.1];

159.2. consumer products are subject to requirements set out in Annex 4 or their provision on the market has been authorized by the Radiation Protection Centre.

160. The design, manufacture and provision of consumer products, with regard to features that could affect human exposure during normal handling, transport and use, as well as in the event of mishandling, misuse, accident or disposal, shall be subject to the optimization of radiation protection, set in [5.1]

161. In this regard the undertakings, designers, manufacturers and other providers or suppliers of consumer products shall take into account the following:

161.1. the various radionuclides that were used or could be used in manufacture of consumer products and their radiation types, energies, activities and half-lives;

161.2. the chemical and physical forms of the radionuclides that could be used in consumer products and their significance for protection and safety in normal conditions and abnormal conditions;

161.3. the containment and shielding of radioactive substances in consumer products and access to these radioactive substances in normal conditions and abnormal conditions;

161.4. the need for servicing or repair of consumer products and ways in which this could be done;

161.5. relevant experience with similar consumer products.

162. The undertakings providing or supplying consumer products shall ensure that:

162.1. where practicable, a legible label is firmly affixed to a visible surface of each consumer product that:

162.1.1. states that the consumer product contains radioactive substances and identifies the radionuclides and their activities at the date of manufacture;

162.1.2. states that the placing of the consumer products on the market has been authorized by the Radiation Protection Centre;

162.1.3. provides information on options for recycling or disposal;

162.2. the information in Lithuanian language listed below shall be enclosed with the consumer product:

162.2.1. instructions for correct installation, use and maintenance of the consumer product;

162.2.2. instructions for servicing and repair;

162.2.3. information about the radionuclides and their activities at a date of manufacture;

162.2.4. information about the dose rates in normal operation and during servicing and repair;

162.2.5. information about options for recycling or disposal;

162.3. Consumer product retailers shall be provided with appropriate information on radiation protection requirements and instructions on their transport and storage.

CHAPTER IX
EXISTING EXPOSURE SITUATIONS

SECTION 1
INDOOR RADON

163. Radon risk assessment, including the identification of radon risk areas, is carried out in accordance with the Radon Risk Assessment Program approved by the Minister of Health.

If radon risk assessment is planned to be carried out at the nuclear facility, the Radon Risk Assessment Program shall be coordinated with the State Nuclear Power Safety Inspectorate

164. Radiation Protection Centre, performing implementation of Radon Risk Assessment Program, including the identification of radon risk areas, identifies buildings in which average annual activity concentration of radon in indoor air exceeds the reference levels specified in paras. 86 or 165.

165. The reference level of the average annual radon activity concentration of building indoor air, with the exception of building indoor air at the workplace, is 300 Bq/m^3.

166. The radon risk area is considered as an area where the average annual radon activity concentration of building indoor air exceeds the reference level laid down in para. 86 or 165 at 10 percent of all buildings measured.

167. Once a radon risk area has been identified, a Radon Risk Management Action Plan shall be developed, which shall include the risk management of radon from soil, building materials or water. The content of the Radon Risk Management Action Plan is listed in Annex 9.

168. Radiation Protection Centre supervises the implementation of radiation protection measures in the radon risk area. The State Nuclear Power Safety Inspectorate supervises the implementation of radiation protection measures in the nuclear facility if, after the radon risk assessment, the nuclear facility falls into the radon risk zone.

169. Radiation Protection Centre informs members of the public living in the premises, where the reference level set in para. 165 is being exceeded, on the potential hazard to their health and advises on ways to reduce indoor radon and informs about the importance of implementation of remedial measures to reduce the activity concentration of radon.

SECTION 2
EQUIVALENT DOSE RATE OF NATURAL EXTERNAL GAMMA RADIATION IN PREMISES

170. The equivalent dose rate of natural external gamma radiation shall not exceed the following reference levels:

170.1. 0,35 μSv/h. in residential premises;

170.2. 0,45 μSv/h. in workplaces. This requirement does not apply to workplaces in premises where activities with materials involving naturally occurring radioactive materials are carried out and such practices shall be authorised in accordance with order set in [5.1].

171. Radiation Protection Centre informs members of the public living in premises where the reference level specified in para. 170.1 of the hygiene standard is exceeded, about the possible hazard to their health and ways of reducing the dose rate.

172. If reference level in the workplace referred to in para. 170.2 is exceeded, the employer must immediately inform the Radiation Protection Centre and take steps to reduce the equivalent dose rate of natural external gamma radiation to the reference level specified in para. 170.2.

SECTION 3
PERMITTED ACTIVITY CONCENTRATION INDEXES FOR THE GAMMA RADIATION EMMITTED BY BUILDING MATERIALS

173. External exposure of gamma radiation emitted by building materials to the general public shall not exceed the reference level of 1 mSv per year;

174. Manufacturers, importers, distributors or authorized representatives of building materials must ensure that building materials listed in Annex 10 are radiologically tested prior to the placing on the market.

175. Radiological testing documentation and, in case of producing or supplying to the market the building materials listed at para. 2 of Annex 10, documented evidence about the

percentage of processed residues of naturally occurring radioactive materials incorporated in the building materials must be provided to Radiation Protection Centre at the request;

176. The building materials listed in Annex 10 may be used:

176.1. without limitation and in any amount, if activity concentration index calculated using the formula:

$$I = (a_{Ra}/300) + (a_{Th}/200) + (a_K/3000)$$

does not exceed 1.

Where a_{Ra}, a_{Th}, a_K – ^{226}Ra, ^{232}Th and ^{40}K activity concentration, Becquerel per kilogram (Bq/kg);

176.2. in small quantities (not more than 10% of the total amount of building material used for the structure), in case activity concentration index, calculated according to the formula specified in para. 176.1, for the building material does not exceed 2;

176.3. for the construction of streets, roads and yards, if the activity concentration index calculated according to the formula:

$$I = (a_{Ra}/700) + (a_{Th}/500) + (a_K/8000) + (a_{Cs}/2000)$$

does not exceed 1.

Where a_{Ra}, a_{Th}, a_K, a_{Cs} – ^{226}Ra, ^{232}Th, ^{40}K and ^{137}Cs activity concentration, Becquerel per kilogram (Bq/kg);

176.4. for landscaping (pits, levelling), if activity concentration index calculated using the formula:

$$I = (a_{Ra}/2000) + (a_{Th}/1500) + (a_K/20000) + (a_{Cs}/5000)$$

does not exceed 1.

Čia a_{Ra}, a_{Th}, a_K, a_{Cs} – ^{226}Ra, ^{232}Th, ^{40}K andr ^{137}Cs activity concentration, Becquerel per kilogram (Bq/kg).

177. The activity concentration index applies to the building material and not to its constituents except when those constituents are building materials themselves, which are separately assessed as such;

178. When incorporating into building materials constituents including residues resulting from the processing of materials containing naturally occurring radioactive materials, it is necessary to assess the extent to which they may be incorporated in order not to exceed the relevant activity concentration index set in para. 176.

179. Building materials listed in Annex 10 exceeding the relevant activity concentration index value specified in para. 176 may be used only after assessing the annual exposure dose to members of the public taking into account the purpose of the structure, the intended amount to be incorporated into construction material, density, layer thickness, and in coordination with the Radiation Protection Centre.

SECTION 4
RADON AND ITS DECAY PRODUCTS IN NATURAL MINERAL WATER

180. Activity concentration of radon and its decay products in natural mineral water shall not exceed permitted levels:

180.1. for radon (^{222}Rn) – 100 Bq/l;

180.2. for polonium (^{210}Po) – 0,1 Bq/l;

180.3. for bismuth (^{210}Bi) – 0,2 Bq/l.

181. In case permitted level of radon activity concentration set in the para. 180.1 is exceeded the analysis of activity concentration of radon decay products indicated in para. 180.2 and 180.3 shall be performed.

182. Natural mineral water with a activity concentration of radon or its decay products in excess of the relevant permitted level set out in point 180 may be used or placed on the market only after application of a activity concentration reduction measures for radon or its decay products.

SECTION 5
EXISTING EXPOSURE SITUATION MANAGEMENT PROGRAMS

183. Radiation Protection Centre is assessing whether there are any circumstances that may give rise to an existing exposure situation referred to in Annex 11 and, after assessing the exposure of workers and the population due to such exposure situation, determines whether the current exposure situation needs to be declared.

184. The existing exposure situation is declared when the reference levels for exposure of the population in the existing exposure situation as set out in Annex 5 are reached.

185. In the cases of existing exposure situations listed in Annex 11, except for the existing exposure situation referred to in para. 2.1 of this Annex, an Existing Exposure Situation Management Program is developed to ensure the effectiveness of the protective measures in place taking into account the dangers arising from ionizing radiation. This program must contain:

185.1. the objectives, goals, including long-term goals, and reference levels for exposure of the general population to the existing exposure situation, as set out in Annex 5;

185.2. the protective and remedial measures that are planned to be implemented, their scope and duration, the procedures on evaluation of their effectiveness and, where appropriate, procedure on strengthening of protective measures and development of remedial measures to optimize radiation protection and reduce population exposure above the reference level;

185.3. the procedures on monitoring of exposure of the general population and workers, including assessment of the distribution of doses;

185.4. the procedure on distribution of information to the general population regarding the potential impact of ionizing radiation on their health and the measures to be taken for the control and reduction of exposure;

185.5. the procedure on consulting general population and municipal institutions on exposure management issues;

185.6. the frequency of reviewing of the measures under the Existing Exposure Situation Management Program;

185.7. the arrangements for keeping documents regarding implementation of Existing Exposure Situation Management Program.

186. In the case of an existing exposure situation as referred in para. 1 of Annex 11, Existing Exposure Situation Management Program in addition to the measures specified in para. 184, shall include:

186.1. the procedure on delineation of the affected areas;

186.2. the procedure on identification of the affected members of the public;

186.3. the procedure on delineation of different contamination zones in the affected areas;

186.4. the prohibition of access to contaminated sites or the procedure on control of access to those sites;

186.5. the procedure on limiting living conditions in a contaminated site.

187. Once the existing exposure situation resulting from radon exposure is identified, as specified in para. 2.1 of Annex 11, a Radon Risk Management Action Plan shall be developed in accordance with para. 167.

188. The Existing Exposure Situation Management Program or Radon Risk Management Action Plan must be coordinated with the authorities whose functions are defined in the Existing Exposure Situation Management Program or Radon Risk Management Action Plan and with the Radiation Protection Centre.

189. In case of registered practice involving the production of materials containing naturally occurring radioactive material is carried out in the existing exposure situation area the undertaking must submit to the Radiation Protection Centre information on activity concentrations of radionuclides in the materials produced, the results of exposure monitoring of members of the public and workers and the radiation protection measures applied to optimize the exposure of the members of the public and workers by 1st February of each year.

190. In case of existing exposure situations listed in Annex 11, except for existing exposure situations listed in paras. 1.2 and 2.1 of this Annex, the Existing Exposure Situation Management Program shall be prepared by the director of the administration of the municipality in whose territory existing exposure situation has been declared in accordance with the provisions of paras. 185 and 186. In case of an existing exposure situation as referred in para. 2.1 of Annex 11, a Radon Risk Management Action Plan shall be developed in accordance with para. 167. The existing exposure situation as specified in para. 1.2 of Annex 11 shall be managed in accordance with the Existing Exposure Situation Management Program approved by the Government.

191. Radiation Protection Centre supervises the radiation protection of general population and the environment in the areas of existing exposure situations.

CHAPTER X
CONTROL OF RADIOACTIVE SOURCES

192. The undertaking carrying out the practice involving radioactive sources must:

192.1. ensure physical security of radioactive sources in accordance with the requirements established in [5.1];

192.2. ensure that sealed radioactive sources and, in the case of unsealed radioactive sources their package, and source containers are marked and labelled with an appropriate sign prescribed by the Lithuanian standard LST EN ISO 361;

192.3. ensure the physical control and inventory of radioactive sources. The undertaking carrying out the practice involving radioactive sources must visually check that the sealed radioactive sources and / or devices or equipment containing the sealed radioactive sources are undamaged;

192.4. in the event of the disappearance, theft, loss, damage, unauthorized use or possession of radioactive sources, spillage, significant leakage or unintended release of radioactive materials into the environment, notify the regulatory body thereof immediately, but not later than 12 hours after the event;

192.5. ensure that, in accordance with the regulations governing the physical security of radioactive sources, the Description of Physical Security is established describing measures to prevent the disappearance, theft, loss, damage, unauthorized use or possession or its damage by fire;

192.6. ensure that suitable tests, such as leakage tests are being performed in accordance with workplace monitoring legislation. Sealed radioactive sources shall also be checked for the leakage after each event, including fire, which may have damaged the sealed radioactive source, and the regulatory body shall be notified about the results and the measures taken within 3 working days after the receipt of the leakage test results;

192.7. ensure that radioactive sources are used in accordance with the manufacturer's instructions for use;

192.8. ensure that radioactive sources which are no longer used or intended to be used or those radioactive sources which, having assessed their technical condition and nature of the

practice of the radioactive sources and having determined that the practice with these radioactive sources may no longer continue, are immediately returned to the radioactive source supplier or, if this is not possible, removed to a disposal facility in accordance with the requirements established in [5.2]. In order to sell or transfer radioactive sources to another person it is necessary to make sure that the practice he is carrying out is authorized in accordance with the requirements established in [5.1].

193. The undertaking carrying out the practice involving high activity sealed radioactive sources is required:

193.1. to register each high activity sealed radioactive source using Standard Record Sheet for High Activity Sealed Radioactive Sources (hereafter – Standard Record) provided in Annex 12;

193.2. to submit an electronic or written copy of the Standard Record to the State Register of Sources of Ionizing Radiation and Occupational Exposure in accordance with the procedure established by the Minister of Health:

193.2.1. within 10 working days after date of purchase of a high activity sealed radioactive source;

193.2.2. by the 31st of January of each calendar year;

193.2.3. no later than 10 working days if the situation indicated on the Standard Record has changed;

193.2.4. upon transfer of a high activity sealed radioactive source to another undertaking which is carrying out the practice involving radioactive sources, or transfer to the radioactive waste repository – not later than within 10 working days from the date of transfer of such source. In this case, the Standard Record must include the information on the undertaking receiving the high activity sealed radioactive source;

193.2.5. no later than 10 working days after the end of practice with a high activity sealed radioactive source;

193.2.6. at the request of the regulatory body.

194. The undertaking producing or supplying high activity sealed radioactive sources must ensure that:

194.1. each high activity sealed source is identified by a unique number. This number shall be engraved or stamped on the source, where practicable. The number shall also be engraved or stamped on the source container. If this is not feasible, or in the case of reusable transport containers, the identification number of the high activity sealed radioactive source, the radionuclide, activity at the date of manufacturing and the date of manufacture shall be provided by other means;

194.2. the source container must be marked and labelled with an appropriate sign prescribed by the Lithuanian standard LST EN ISO 361 and, where practicable, the source must be marked and labelled with an appropriate sign prescribed by the Lithuanian standard LST EN ISO 21482.

195. The undertaking producing high activity sealed radioactive sources must keep pictures of each manufactured radioactive source design type and the typical radioactive source container. These pictures must be provided to each operator who has purchased a high activity sealed radioactive source.

196. The undertaking carrying out the practice involving high activity sealed radioactive sources must make sure that each high activity sealed source is accompanied by written information indicating that the source is identified and marked in compliance with para. 194 and that the markings and labels referred to in para. 194 remain legible. Together with written information must be provided:

196.1. certificate of high activity sealed radioactive source (technical passport) or a copy of a certificate;

196.2. pictures of the source, source container, transport packaging, device and equipment as appropriate.

CHAPTER XI
FINAL PROVISIONS

197. Person planning to carry out the practice and the undertaking in case of violation of the requirements of the hygiene standard shall be liable in accordance with the procedure established by legal acts.

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CATEGORIES FOR SOURCES AND PROCEDURES FOR THEIR DETERMINATION

1. The categories shall be determined for all radioactive sources with an activity (hereinafter – A) above the total activity values of exemption levels set out in Table 4 of Annex 4. The risk categories are listed in Table 1.

Table 1. Categories

Category	Radioactive sources	A/D
I	Sealed radioactive sources used for irradiation; Teletherapy sealed radioactive sources; Sealed radioactive sources for calibration[1]	A/D≥1000
II	Industrial gamma radiography sealed radioactive sources; High/medium dose rate brachytherapy sealed radioactive sources; Sealed radioactive sources for calibration[1]	1000>A/D≥10
III	Industrial gauges incorporating high activity sealed radioactive sources: level, foreign body detection gauges; Well logging gauges with sealed radioactive sources; Sealed radioactive sources for calibration[1]	10>A/D≥1
IV	Industrial gauges with sealed radioactive sources: density, depth, humidity, fill gauges; Low dose rate brachytherapy sealed radioactive sources (except eye plaques and permanent implants with sealed radioactive sources) Sealed radioactive sources for calibration[1]; unsealed radioactive sources used for diagnostic or therapeutic purposes in nuclear medicine[2]	1>A/D≥0,01
V	Low dose rate brachytherapy eye plaques and permanent implant sealed radioactive sources; Sealed radioactive sources for calibration[1]; unsealed radioactive sources used in research, industrial and etc, facilities[2]	0,01>A/D≥ exempt level/D

[1] Sealed radioactive sources for calibration may be assigned to any category depending on the use of the radionuclide, its‘ A and the specific area of use of sealed radioactive source.

[2] Unsealed radioactive sources are generally classified as category IV or V, however, given that unsealed radioactive sources are in liquid form and have a short half-life, each atypical use of unsealed radioactive sources may be assessed individually.

2. Radioactive sources used in different practices are subject to the same category and to the same radiation protection and physical protection measures, which are subject to the same legislation on radiation protection and physical protection.

3. Radioactive sources of categories I – III are considered to be high activity sealed or unsealed radioactive sources, which shall be subject to additional measures of radiation protection and physical protection referred to in paras. 34.2 and 192.4, and 156, 157 and 193-196 and requirements for physical protection of radioactive sources established by the Minister of Health or the State Nuclear Power Safety Inspectorate.

4. If the radioactive source is not listed in Table 1, the category is determined by the ratio of A to D (for certain radionuclides D in Table 2):

4.1. if A/D≥1000, the radioactive source is classified as category I;
4.2. if 1000>A/D≥10, the radioactive source is classified as category II;
4.3. if 10>A/D≥1, the radioactive source is classified as category III;
4.4. if 1>A/D≥0,01, the radioactive source is classified as category IV;
4.5. if 0,01>A/D≥exempt level/D, the radioactive source is classified as category V.

Table 2. For certain radionuclides D value

Radionuclide	**D, TBq**	**Radionuclide**	**D, TBq**
^{3}H	2×10^{3}	^{147}Pm	4×10^{1}
^{32}P	1×10^{1}	^{153}Gd	1×0^{0}
^{55}Fe	8×10^{2}	^{170}Tm	2×10^{1}
^{57}Co	7×10^{-1}	^{169}Yb	3×10^{-1}
^{60}Co	3×10^{-2}	^{192}Ir	8×10^{-2}
^{63}Ni	6×10^{1}	^{198}Au	2×10^{-1}
^{68}Ge	7×10^{-2}	^{204}Tl	2×10^{1}
^{75}Se	2×10^{-1}	^{210}Po	6×10^{-2}
^{85}Kr	3×10^{1}	^{226}Ra	4×10^{-2}
^{90}Sr (^{90}Y)	1×10^{0}	^{238}Pu	6×10^{-2}
^{99}Mo	3×10^{-1}	^{239}Pu	6×10^{-2}
^{99m}Tc	7×10^{-1}	$^{239}Pu/Be$	6×10^{-2}
^{106}Ru (^{106}Rh)	3×10^{-1}	^{241}Am	6×10^{-2}
^{109}Cd	2×10^{1}	$^{241}Am/Be$	6×10^{-2}
^{125}I	2×10^{-1}	^{242}Cm	5×10^{-2}
^{131}I	2×10^{-1}	^{244}Cm	2×10^{-2}
^{137}Cs	1×10^{-1}	^{252}Cf	2×10^{-2}
^{133}Ba	2×10^{-1}	-	-

5. If, according to the ratio A/D, the radioactive source falls into a lower category but its' A level equal to or greater than specified in Table 3, the radioactive source is classified in a higher category (for example, a radioactive source previously classified in category IV, after evaluation of radioactive source A, is classified as category III).

Table 3. A of the radionuclide, from which a radioactive source is considered as a high activity sealed or unsealed radioactive source

Radionuclide	**A, TBq**
^{55}Fe	0,4
^{60}Co	0,004
^{75}Se	0,03
$^{85}Kr^{2}$	0,1
$^{90}Sr^{2}$	0,003
^{103}Pd	0,4
^{125}I	0,2
$^{137}Cs^{2}$	0,02
^{147}Pm	0,4
^{153}Gd	0,1
^{170}Tm	0,03
^{192}Ir	0,01
^{204}Tl	0,1
$^{226}Ra^{2}$	0,002

^{238}Pu[1]	0,1
^{241}Am[2]	0,1
^{252}Cf	0,005

[1] Also daughter radionuclides with a half-life of less than 10 days.
[2] Also neutrons sources with beryllium.

6. For the transport of radioactive sources in a single vehicle or in the storage facility, a category shall be established for all radioactive sources summed activity. The ratio A/D of all radioactive sources containing different radionuclides is calculated by the formula:

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

where:
$A_{i,n}$ – activity of each individual source i of radionuclide n;
D_n – D value for radionuclide n.

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RADIATION AND TISSUE WEIGHTING FACTORS

1. Radiation weighting factors are laid down in table 1.

Table 1. Radiation weighting factors

Radiation type (R)	**W_R**[1]
Photons	1
Electrons and muons	1
Protons and charged pions	2
Alpha particles, fission fragments, heavy ions	20
Neutrons, E_n < 1 MeV	$2{,}5 + 18{,}2e^{-[ln(E_n)]^2/6}$
Neutrons, 1 MeV ≤ E_n ≤ 50 MeV	$5{,}0 + 17{,}0e^{-[ln(2E_n)]^2/6}$
Neutrons, E_n > 50 MeV	$2{,}5 + 3{,}25e^{-[ln(0{,}04E_n)]^2/6}$

[1]Note: All values (W_R) relate to the radiation incident on the body or, for internal radiation sources, emitted from the incorporated radionuclide(s).

2. Tissue weighting factors are laid dawn in Table 2.

Table 2. Tissue weighting factors

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

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

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LIST OF PRACTICES INVOLVING NATURALLY-OCCURRING RADIOACTIVE MATERIALS CAUSING EXPOSURE OF WORKERS OR MEMBERS OF THE PUBLIC WHICH CANNOT BE DISREGARDED FROM A RADIATION PROTECTION POINT OF VIEW

Practices involving naturally-occurring radioactive materials causing exposure of workers or members of the public which cannot be disregarded from a radiation protection point of view:

1. Extraction of rare earths from monazite.
2. Production of thorium compounds and manufacture of thorium-containing products.
3. Processing of niobium and (or) tantalum ore.
4. Oil and gas product.
5. Geothermal energy industrial production.
6. TiO_2 pigment production.
7. Thermal phosphorus production.
8. Zircon and zirconium industry.
9. Production of phosphate fertilizers.
10. Cement production, maintenance of clinker ovens.
11. Coal-fired power plants, maintenance of boilers.
12. Phosphoric acid production.
13. Primary iron production.
14. Tin, lead and copper smelting.
15. Industrial ground water filtration facilities.
16. Mining of ores other than uranium ore.

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EXEMPTION FROM NOTIFICATION, EXEMPTION LEVELS

1. Practices do not need to be notified as required in [5.1], if they involve following:

1.1. radioactive materials where the quantities of the activity or activity concentrations involved do not exceed in total the exemption values set out in para. 2 of this Annex or on the basis of higher values that, for specific applications, are approved by the regulatory body in accordance with the general exemption and clearance criteria set [5.1];

1.2. apparatus containing a sealed source, provided that:

1.2.1. the apparatus is of a type approved by the regulatory body;

1.2.2. the apparatus does not cause, in normal operating conditions, a dose rate exceeding 1 μSv/h at a distance of 0.1 m from any accessible surface;

1.2.3. conditions for recycling or disposal have been specified by the regulatory body;

1.3. any electrical apparatus provided that:

1.3.1. it is a cathode ray tube intended for the display of visual images, or other electrical apparatus operating at a potential difference not exceeding 30 kilo volt (kV), or it is of a type approved by the regulatory body;

1.3.2. it does not cause, in normal operating conditions, a dose rate exceeding 1 μSv/h at a distance of 0.1 m from any accessible surface.

2. Exemption levels:

2.1. The exempt activity concentration values (in $kBq \cdot kg^{-1}$) for the materials involved in the practice are laid down in Table 1. The values in Table 1, are given for individual radionuclides, where applicable, including short-lived radionuclides in equilibrium with the parent nuclide, as indicated. The values in Table 3, apply to all radionuclides in the decay chain of U-238 or Th-232, but for segments of the decay chain, which are not in equilibrium with the parent radionuclide, higher values may be applied;

2.2. The total activity values (in Bq) for exemption apply to the total activity involved in a practice and are laid down in Table 4 for artificial radionuclides and for some naturally-occurring radionuclides used in consumer products. The values in Table 5, are given for individual radionuclides, where applicable, including short-lived radionuclides in equilibrium with the parent nuclide, as indicated. For other practices involving naturally-occurring radionuclides, such values are, in general, not applicable;

2.3. For mixtures of artificial radionuclides, the weighted sum of nuclide-specific activities or concentrations (for various radionuclides contained in the same matrix) divided by the corresponding exemption value shall be less than unity. Where appropriate, this condition can be verified on the basis of best estimates of the composition of the radionuclide mix. The values in Table 1, apply individually to each parent nuclide. Some elements in the decay chain, e.g. Po-210 or Pb-210, may warrant the use of higher values taking Community guidance into account.

2.4. The values laid down in Table 4, apply to the total inventory of radioactive substances held by a person or the undertaking as part of a specific practice at any point in time. Regulatory body may apply these values to smaller entities or packages, for instance to exempt the transport or storage of exempted consumer products, if the general exemption criteria in section 3 are satisfied.

3. General exemption criteria shall be applied in accordance with the following requirements:

3.1. Practices involving small amounts of radioactive substances or low activity concentrations, comparable to the exemption values laid down in Tables 1, 3 and 4 are deemed to be inherently safe as it‘s set in point 3 of part 1 of Article 11 in [5.1];

3.2. Practices involving amounts of radioactive substances or activity concentrations below the exemption values laid down in Tables 1 and 4 are deemed to such that the radiological risks to

individuals caused by the practice are sufficiently low, as to be of no regulatory concern without further consideration as it‘s set in point 1 of part 1 of Article 11 in [5.1]. This is also the case for the values in Table 3, with the exception of the recycling of residues in building materials or the case of specific exposure pathways, for instance, drinking water;

3.3. In the case of moderate amounts of material the activity concentration values laid down in Table 4 may be used instead of the values laid down in Table 1, for the purpose of exemption from authorisation;

3.4. For the purpose of exemption from notification where amounts of radioactive substances or activity concentrations do not comply with the values laid down in Tables 1, 3 and 4 an assessment shall be made in the light of the general criteria set in Article 11 of [5.1]. For compliance with the general criterion set in point 1 of part 1 of Article 11 in [5.1], it shall be demonstrated that workers should not be classified as exposed workers, and the following criteria for the exposure of members of the public are met in all feasible circumstances:

3.4.1. for artificial radionuclides effective dose expected to be incurred by a member of the public due to the exempted practice is of the order of 10 μSv or less in a year;

3.4.2. for naturally-occurring radionuclides the dose increment, allowing for the prevailing background radiation from natural radiation sources, liable to be incurred by an individual due to the exempted practice is of the order of 1 mSv or less in a year. The assessment of doses to members of the public shall take into account not only pathways of exposure through airborne or liquid effluent, but also pathways resulting from the disposal or recycling of solid residues.

Table 1. Activity concentration values for exemption of materials which can be applied by default to any amount and to any type of solid material for artificial radionuclides

No.	**Radionuclide**	**Activity concentration (kBq · kg^{-1})**
1.	H-3	100
2.	Be-7	10
3.	C-14	1
4.	F-18	10
5.	Na-22	0,1
6.	Na-24	1
7.	Si-31	1000
8.	P-32	1000
9.	P-33	1000
10.	S-35	100
11.	Cl-36	1
12.	Cl-38	10
13.	K-42	100
14.	K-43	10

No.	Radionuclide	Activity concentration (kBq · kg^{-1})
15.	Ca-45	100
16.	Ca-47	10
17.	Sc-46	0,1
18.	Sc-47	100
19.	Sc-48	1
20.	V-48	1
21.	Cr-51	100
22.	Mn-51	10
23.	Mn-52	1
24.	Mn-52m	10
25.	Mn-53	100
26.	Mn-54	0,1
27.	Mn-56	10
28.	Fe-52[1]	10
29.	Fe-55	1000
30.	Fe-59	1
31.	Co-55	10
32.	Co-56	0,1
33.	Co-57	1
34.	Co-58	1
35.	Co-58 m	10000
36.	Co-60	0,1
37.	Co-60 m	1000
38.	Co-61	100
39.	Co-62 m	10

No.	Radionuclide	Activity concentration (kBq · kg^{-1})
40.	Ni-59	100
41.	Ni-63	100
42.	Ni-65	10
43.	Cu-64	100
44.	Zn-65	0,1
45.	Zn-69	1000
46.	Zn-69 m[1]	10
47.	Ga-72	10
48.	Ge-71	10000
49.	As-73	1000
50.	As-74	10
51.	As-76	10
52.	As-77	1000
53.	Se-75	1
54.	Br-82	1
55.	Rb-86	100
56.	Sr-85	1
57.	Sr-85 m	100
58.	Sr-87 m	100
59.	Sr-89	1000
60.	Sr-90[1]	1
61.	Sr-91[1]	10
62.	Sr-92	10
63.	Y-90	1000
64.	Y-91	100

No.	Radionuclide	Activity concentration (kBq · kg^{-1})
65.	Y-91 m	100
66.	Y-92	100
67.	Y-93	100
68.	Zr-93	10
69.	Zr-95[1]	1
70.	Zr-97[1]	10
71.	Nb-93 m	10
72.	Nb-94	0,1
73.	Nb-95	1
74.	Nb-97[1]	10
75.	Nb-98	10
76.	Mo-90	10
77.	Mo-93	10
78.	Mo-99[1]	10
79.	Mo-101[1]	10
80.	Tc-96	1
81.	Tc-96 m	1000
82.	Tc-97	10
83.	Tc-97 m	100
84.	Tc-99	1
85.	Tc-99 m	100
86.	Ru-97	10
87.	Ru-103[1]	1
88.	Ru-105[1]	10
89.	Ru-106[1]	0,1

No.	Radionuclide	Activity concentration (kBq · kg^{-1})
90.	Rh-103 m	10000
91.	Rh-105	100
92.	Pd-103[1]	1000
93.	Pd-109[1]	100
94.	Ag-105	1
95.	Ag-110 m[1]	0,1
96.	Ag-111	100
97.	Cd-109[1]	1
98.	Cd-115[1]	10
99.	Cd-115 m[1]	100
100.	In-111	10
101.	In-113 m	100
102.	In-114 m[1]	10
103.	In-115 m	100
104.	Sn-113[1]	1
105.	Sn-125	10
106.	Sb-122	10
107.	Sb-124	1
108.	Sb-125[1]	0,1
109.	Te-123 m	1
110.	Te-125 m	1000
111.	Te-127	1000
112.	Te-127 m[1]	10
113.	Te-129	100
114.	Te-129 m[1]	10

No.	Radionuclide	Activity concentration (kBq · kg^{-1})
115.	Te-131	100
116.	Te-131 m[1]	10
117.	Te-132[1]	1
118.	Te-133	10
119.	Te-133 m	10
120.	Te-134	10
121.	I-123	100
122.	I-125	100
123.	I-126	10
124.	I-129	0,01
125.	I-130	10
126.	I-131	10
127.	I-132	10
128.	I-133	10
129.	I-134	10
130.	I-135	10
131.	Cs-129	10
132.	Cs-131	1000
133.	Cs-132	10
134.	Cs-134	0,1
135.	Cs-134 m	1000
136.	Cs-135	100
137.	Cs-136	1
138.	Cs-137[1]	0,1
139.	Cs-138	10

No.	Radionuclide	Activity concentration (kBq · kg^{-1})
140.	Ba-131	10
141.	Ba-140	1
142.	La-140	1
143.	Ce-139	1
144.	Ce-141	100
145.	Ce-143	10
146.	Ce-144	10
147.	Pr-142	100
148.	Pr-143	1000
149.	Nd-147	100
150.	Nd-149	100
151.	Pm-147	1000
152.	Pm-149	1000
153.	Sm-151	1000
154.	Sm-153	100
155.	Eu-152	0,1
156.	Eu-152 m	100
157.	Eu-154	0,1
158.	Eu-155	1
159.	Gd-153	10
160.	Gd-159	100
161.	Tb-160	1
162.	Dy-165	1000
163.	Dy-166	100
164.	Ho-166	100

No.	Radionuclide	Activity concentration (kBq · kg^{-1})
165.	Er-169	1000
166.	Er-171	100
167.	Tm-170	100
168.	Tm-171	1000
169.	Yb-175	100
170.	Lu-177	100
171.	Hf-181	1
172.	Ta-182	0,1
173.	W-181	10
174.	W-185	1000
175.	W-187	10
176.	Re-186	1000
177.	Re-188	100
178.	Os-185	1
179.	Os-191	100
180.	Os-191 m	1000
181.	Os-193	100
182.	Ir-190	1
183.	Ir-192	1
184.	Ir-194	100
185.	Pt-191	10
186.	Pt-193 m	1000
187.	Pt-197	1000
188.	Pt-197 m	100
189.	Au-198	10

No.	Radionuclide	Activity concentration (kBq · kg^{-1})
190.	Au-199	100
191.	Hg-197	100
192.	Hg-197 m	100
193.	Hg-203	10
194.	Tl-200	10
195.	Tl-201	100
196.	Tl-202	10
197.	Tl-204	1
198.	Pb-203	10
199.	Bi-206	1
200.	Bi-207	0,1
201.	Po-203	10
202.	Po-205	10
203.	Po-207	10
204.	At-211	1000
205.	Ra-225	10
206.	Ra-227	100
207.	Th-226	1000
208.	Th-229	0,1
209.	Pa-230	10
210.	Pa-233	10
211.	U-230	10
212.	U-231[1]	100
213.	U-232[1]	0,1
214.	U-233	1

No.	Radionuclide	Activity concentration (kBq · kg^{-1})
215.	U-236	10
216.	U-237	100
217.	U-239	100
218.	U-240[1]	100
219.	Np-237[1]	1
220.	Np-239	100
221.	Np-240	10
222.	Pu-234	100
223.	Pu-235	100
224.	Pu-236	1
225.	Pu-237	100
226.	Pu-238	0,1
227.	Pu-239	0,1
228.	Pu-240	0,1
229.	Pu-241	10
230.	Pu-242	0,1
231.	Pu-243	1000
232.	Pu-244[1]	0,1
233.	Am-241	0,1
234.	Am-242	1000
235.	Am-242 m[1]	0,1
236.	Am-243[1]	0,1
237.	Cm-242	10
238.	Cm-243	1
239.	Cm-244	1

No.	Radionuclide	Activity concentration (kBq · kg^{-1})
240.	Cm-245	0,1
241.	Cm-246	0,1
242.	Cm-247[1]	0,1
243.	Cm-248	0,1
244.	Bk-249	100
245.	Cf-246	1000
246.	Cf-248	1
247.	Cf-249	0,1
248.	Cf-250	1
249.	Cf-251	0,1
250.	Cf-252	1
251.	Cf-253	100
252.	Cf-254	1
253.	Es-253	100
254.	Es-254[1]	0,1
255.	Es-254 m[1]	10
256.	Fm-254	10000
257.	Fm-255	100

[1] Parent radionuclides and their progeny whose dose contributions are taken into account in the dose calculation (thus requiring only the exemption level of the parent radionuclide to be considered), are listed in the table 2.

Table 2. Parent radionuclides, and their progeny

No.	Parent radionuclides	Progeny
1.	Fe-52	Mn-52 m
2.	Zn-69 m	Zn-69
3.	Sr-90	Y-90
4.	Sr-91	Y-91 m

No.	Parent radionuclides	Progeny
5.	Zr-95	Nb-95
6.	Zr-97	Nb-97 m, Nb-97
7.	Nb-97	Nb-97 m
8.	Mo-99	Tc-99 m
9.	Mo-101	Tc-101
10.	Ru-103	Rh-103 m
11.	Ru-105	Rh-105 m
12.	Ru-106	Rh-106
13.	Pd-103	Rh-103 m
14.	Pd-109	Ag-109 m
15.	Ag-110 m	Ag-110
16.	Cd-109	Ag-109 m
17.	Cd-115	In-115 m
18.	Cd-115 m	In-115 m
19.	In-114 m	In-114
20.	Sn-113	In-113 m
21.	Sb-125	Te-125 m
22.	Te-127 m	Te-127
23.	Te-129 m	Te-129
24.	Te-131 m	Te-131
25.	Te132	I-132
26.	Cs-137	Ba-137 m
27.	Ce-144	Pr-144, Pr-144 m
28.	U-232	Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208
29.	U-240	Np-240 m, Np-240

No.	Parent radionuclides	Progeny
30.	Np-237	Pa-233
31.	Pu-244	U-240, Np-240 m, Np-240
32.	Am-242 m	Np-238
33.	Am-243	Np-239
34.	Cm-247	Pu-243
35.	Es-254	Bk-250
36.	Es-254 m	Fm-254

For radionuclides not listed in Table 1 the regulatory body shall assign appropriate values for the quantities and concentrations of activity per unit mass where the need arises.

Table 3. Values for exemption for naturally occurring radionuclides in solid materials in secular equilibrium with their progeny

No.	Radionuclide	Activity concentration ($kBq \cdot kg^{-1}$)
1.	Natural radionuclides from the U-238 series	1
2.	Natural radionuclides from the Th-232 series	1
3.	K-40	10

Table 4. Total activity values for exemption and exemption values for the activity concentration in moderate amounts of any type of material

No.	Radionuclide	Activity concentration ($kBq \cdot kg^{-1}$)	Activity (Bq)
1.	H-3	1×10^6	1×10^9
2.	Be-7	1×10^3	1×10^7
3.	C-14	1×10^4	1×10^7
4.	O-15	1×10^2	1×10^9
5.	F-18	1×10^1	1×10^6
6.	Na-22	1×10^1	1×10^6
7.	Na-24	1×10^1	1×10^5
8.	Si-31	1×10^3	1×10^6
9.	P-32	1×10^3	1×10^5

No.	Radionuclide	Activity concentration ($kBq \cdot kg^{-1}$)	Activity (Bq)
10.	P-33	1×10^5	1×10^8
11.	S-35	1×10^5	1×10^8
12.	Cl-36	1×10^4	1×10^6
13.	Cl-38	1×10^1	1×10^5
14.	Ar-37	1×10^6	1×10^8
15.	Ar-41	1×10^2	1×10^9
16.	K-40[1]	1×10^2	1×10^6
17.	K-42	1×10^2	1×10^6
18.	K-43	1×10^1	1×10^6
19.	Ca-45	1×10^4	1×10^7
20.	Ca-47	1×10^1	1×10^6
21.	Sc-46	1×10^1	1×10^6
22.	Sc-47	1×10^2	1×10^6
23.	Sc-48	1×10^1	1×10^5
24.	V-48	1×10^1	1×10^5
25.	Cr-51	1×10^3	1×10^7
26.	Mn-51	1×10^1	1×10^5
27.	Mn-52	1×10^1	1×10^5
28.	Mn-52 m	1×10^1	1×10^5
29.	Mn-53	1×10^4	1×10^9
30.	Mn-54	1×10^1	1×10^6
31.	Mn-56	1×10^1	1×10^5
32.	Fe-52	1×10^1	1×10^6
33.	Fe-55	1×10^4	1×10^6
34.	Fe-59	1×10^1	1×10^6

No.	Radionuclide	Activity concentration ($kBq \cdot kg^{-1}$)	Activity (Bq)
35.	Co-55	1×10^1	1×10^6
36.	Co-56	1×10^1	1×10^5
37.	Co-57	1×10^2	1×10^6
38.	Co-58	1×10^1	1×10^6
39.	Co-58 m	1×10^4	1×10^7
40.	Co-60	1×10^1	1×10^5
41.	Co-60 m	1×10^3	1×10^6
42.	Co-61	1×10^2	1×10^6
43.	Co-62 m	1×10^1	1×10^5
44.	Ni-59	1×10^4	1×10^8
45.	Ni-63	1×10^5	1×10^8
46.	Ni-65	1×10^1	1×10^6
47.	Cu-64	1×10^2	1×10^6
48.	Zn-65	1×10^1	1×10^6
49.	Zn-69	1×10^4	1×10^6
50.	Zn-69 m	1×10^2	1×10^6
51.	Ga-72	1×10^1	1×10^5
52.	Ge-71	1×10^4	1×10^8
53.	As-73	1×10^3	1×10^7
54.	As-74	1×10^1	1×10^6
55.	As-76	1×10^2	1×10^5
56.	As-77	1×10^3	1×10^6
57.	Se-75	1×10^2	1×10^6
58.	Br-82	1×10^1	1×10^6

No.	Radionuclide	Activity concentration ($kBq \cdot kg^{-1}$)	Activity (Bq)
59.	Kr-74	1×10^2	1×10^9
60.	Kr-76	1×10^2	1×10^9
61.	Kr-77	1×10^2	1×10^9
62.	Kr-79	1×10^3	1×10^5
63.	Kr-81	1×10^4	1×10^7
64.	Kr-83 m	1×10^5	1×10^{12}
65.	Kr-85	1×10^5	1×10^4
66.	Kr-85 m	1×10^3	1×10^{10}
67.	Kr-87	1×10^2	1×10^9
68.	Kr-88	1×10^2	1×10^9
69.	Rb-86	1×10^2	1×10^5
70.	Sr-85	1×10^2	1×10^6
71.	Sr-85 m	1×10^2	1×10^7
72.	Sr-87 m	1×10^2	1×10^6
73.	Sr-89	1×10^3	1×10^6
74.	Sr-90	1×10^2	1×10^4
75.	Y-90	1×10^3	1×10^5
76.	Y-91	1×10^3	1×10^6
77.	Sr-91	1×10^1	1×10^5
78.	Sr-92	1×10^1	1×10^6
79.	Y-91 m	1×10^2	1×10^6
80.	Y-92	1×10^2	1×10^5
81.	Y-93	1×10^2	1×10^5
82.	Zr-93[2]	1×10^3	1×10^7
83.	Zr-95	1×10^1	1×10^6

No.	Radionuclide	Activity concentration ($kBq \cdot kg^{-1}$)	Activity (Bq)
84.	Zr-97[2]	1×10^1	1×10^5
85.	Nb-93 m	1×10^4	1×10^7
86.	Nb-94	1×10^1	1×10^6
87.	Nb-95	1×10^1	1×10^6
88.	Nb-97	1×10^1	1×10^6
89.	Nb-98	1×10^1	1×10^5
90.	Mo-90	1×10^1	1×10^6
91.	Mo-93	1×10^3	1×10^8
92.	Mo-99	1×10^2	1×10^6
93.	Mo-101	1×10^1	1×10^6
94.	Tc-96	1×10^1	1×10^6
95.	Tc-96 m	1×10^3	1×10^7
96.	Tc-97	1×10^3	1×10^8
97.	Tc-97 m	1×10^3	1×10^7
98.	Tc-99	1×10^4	1×10^7
99.	Tc-99 m	1×10^2	1×10^7
100.	Ru-97	1×10^2	1×10^7
101.	Ru-103	1×10^2	1×10^6
102.	Ru-105	1×10^1	1×10^6
103.	Ru-106[2]	1×10^2	1×10^5
104.	Rh-103 m	1×10^4	1×10^8
105.	Rh-105	1×10^2	1×10^7
106.	Pd-103	1×10^3	1×10^8
107.	Pd-109	1×10^3	1×10^6

No.	Radionuclide	Activity concentration ($kBq \cdot kg^{-1}$)	Activity (Bq)
108.	Ag-105	1×10^2	1×10^6
109.	Ag-108 m^2	1×10^1	1×10^6
110.	Ag-110 m	1×10^1	1×10^6
111.	Ag-111	1×10^3	1×10^6
112.	Cd-109	1×10^4	1×10^6
113.	Cd-115	1×10^2	1×10^6
114.	Cd-115 m	1×10^3	1×10^6
115.	In-111	1×10^2	1×10^6
116.	In-113 m	1×10^2	1×10^6
117.	In-114 m	1×10^2	1×10^6
118.	In-115 m	1×10^2	1×10^6
119.	Sn-113	1×10^3	1×10^7
120.	Sn-125	1×10^2	1×10^5
121.	Sb-122	1×10^2	1×10^4
122.	Sb-124	1×10^1	1×10^6
123.	Sb-125	1×10^2	1×10^6
124.	Te-123 m	1×10^2	1×10^7
125.	Te-125 m	1×10^3	1×10^7
126.	Te-127	1×10^3	1×10^6
127.	Te-127 m	1×10^3	1×10^7
128.	Te-129	1×10^2	1×10^6
129.	Te-129 m	1×10^3	1×10^6
130.	Te-131	1×10^2	1×10^5
131.	Te-131 m	1×10^1	1×10^6
132.	Te-132	1×10^2	1×10^7

No.	Radionuclide	Activity concentration ($kBq \cdot kg^{-1}$)	Activity (Bq)
133.	Te-133	1×10^1	1×10^5
134.	Te-133 m	1×10^1	1×10^5
135.	Te-134	1×10^1	1×10^6
136.	I-123	1×10^2	1×10^7
137.	I-125	1×10^3	1×10^6
138.	I-126	1×10^2	1×10^6
139.	I-129	1×10^2	1×10^5
140.	I-130	1×10^1	1×10^6
141.	I-131	1×10^2	1×10^6
142.	I-132	1×10^1	1×10^5
143.	I-133	1×10^1	1×10^6
144.	I-134	1×10^1	1×10^5
145.	I-135	1×10^1	1×10^6
146.	Xe-131 m	1×10^4	1×10^4
147.	Xe-133	1×10^3	1×10^4
148.	Xe-135	1×10^3	1×10^{10}
149.	Cs-129	1×10^2	1×10^5
150.	Cs-131	1×10^3	1×10^6
151.	Cs-132	1×10^1	1×10^5
152.	Cs-134 m	1×10^3	1×10^5
153.	Cs-134	1×10^1	1×10^4
154.	Cs-135	1×10^4	1×10^7
155.	Cs-136	1×10^1	1×10^5
156.	Cs-137[2]	1×10^1	1×10^4

No.	Radionuclide	Activity concentration ($kBq \cdot kg^{-1}$)	Activity (Bq)
157.	Cs-138	1×10^1	1×10^4
158.	Ba-131	1×10^2	1×10^6
159.	Ba-140[2]	1×10^1	1×10^5
160.	La-140	1×10^1	1×10^5
161.	Ce-139	1×10^2	1×10^6
162.	Ce-141	1×10^2	1×10^7
163.	Ce-143	1×10^2	1×10^6
164.	Ce-144[2]	1×10^2	1×10^5
165.	Pr-142	1×10^2	1×10^5
166.	Pr-143	1×10^4	1×10^6
167.	Nd-147	1×10^2	1×10^6
168.	Nd-149	1×10^2	1×10^6
169.	Pm-147	1×10^4	1×10^7
170.	Pm-149	1×10^3	1×10^6
171.	Sm-151	1×10^4	1×10^8
172.	Sm-153	1×10^2	1×10^6
173.	Eu-152	1×10^1	1×10^6
174.	Eu-152 m	1×10^2	1×10^6
175.	Eu-154	1×10^1	1×10^6
176.	Eu-155	1×10^2	1×10^7
177.	Gd-153	1×10^2	1×10^7
178.	Gd-159	1×10^3	1×10^6
179.	Tb-160	1×10^1	1×10^6
180.	Dy-165	1×10^3	1×10^6
181.	Dy-166	1×10^3	1×10^6

No.	Radionuclide	Activity concentration ($kBq \cdot kg^{-1}$)	Activity (Bq)
182.	Ho-166	1×10^3	1×10^5
183.	Er-169	1×10^4	1×10^7
184.	Er-171	1×10^2	1×10^6
185.	Tm-170	1×10^3	1×10^6
186.	Tm-171	1×10^4	1×10^8
187.	Yb-175	1×10^3	1×10^7
188.	Lu-177	1×10^3	1×10^7
189.	Hf-181	1×10^1	1×10^6
190.	Ta-182	1×10^1	1×10^4
191.	W-181	1×10^3	1×10^7
192.	W-185	1×10^4	1×10^7
193.	W-187	1×10^2	1×10^6
194.	Re-186	1×10^3	1×10^6
195.	Re-188	1×10^2	1×10^5
196.	Os-185	1×10^1	1×10^6
197.	Os-191	1×10^2	1×10^7
198.	Os-191 m	1×10^3	1×10^7
199.	Os-193	1×10^2	1×10^6
200.	Ir-190	1×10^1	1×10^6
201.	Ir-192	1×10^1	1×10^4
202.	Pt-191	1×10^2	1×10^6
203.	Pt-193 m	1×10^3	1×10^7
204.	Pt-197	1×10^3	1×10^6
205.	Pt-197 m	1×10^2	1×10^6

No.	Radionuclide	Activity concentration ($kBq \cdot kg^{-1}$)	Activity (Bq)
206.	Au-198	1×10^2	1×10^6
207.	Au-199	1×10^2	1×10^6
208.	Hg-197	1×10^2	1×10^7
209.	Hg-197 m	1×10^2	1×10^6
210.	Hg-203	1×10^2	1×10^5
211.	Tl-200	1×10^1	1×10^6
212.	Tl-201	1×10^2	1×10^6
213.	Tl-202	1×10^2	1×10^6
214.	Tl-204	1×10^4	1×10^4
215.	Pb-203	1×10^2	1×10^6
216.	Pb-210[2]	1×10^1	1×10^4
217.	Pb-212[2]	1×10^1	1×10^5
218.	Bi-206	1×10^1	1×10^5
219.	Bi-207	1×10^1	1×10^6
220.	Bi-210	1×10^3	1×10^6
221.	Bi-212[2]	1×10^1	1×10^5
222.	Po-203	1×10^1	1×10^6
223.	Po-205	1×10^1	1×10^6
224.	Po-207	1×10^1	1×10^6
225.	Po-210	1×10^1	1×10^4
226.	At-211	1×10^3	1×10^7
227.	Rn-220[2]	1×10^4	1×10^7
228.	Rn-222[2]	1×10^1	1×10^8
229.	Ra-223[2]	1×10^2	1×10^5
230.	Ra-224[2]	1×10^1	1×10^5

No.	Radionuclide	Activity concentration ($kBq \cdot kg^{-1}$)	Activity (Bq)
231.	Ra-225	1×10^2	1×10^5
232.	Ra-226[2]	1×10^1	1×10^4
233.	Ra-227	1×10^2	1×10^6
234.	Ra-228[2]	1×10^1	1×10^5
235.	Ac-228	1×10^1	1×10^6
236.	Th-226[2]	1×10^3	1×10^7
237.	Th-227	1×10^1	1×10^4
238.	Th-228[2]	1×10^0	1×10^4
239.	Th-229[2]	1×10^0	1×10^3
240.	Th-230	1×10^0	1×10^4
241.	Th-231	1×10^3	1×10^7
242.	Pu-242	1×10^0	1×10^4
243.	Ir-194	1×10^2	1×10^5
244.	Pa-230	1×10^1	1×10^6
245.	Pa-231	1×10^0	1×10^3
246.	Pa-233	1×10^2	1×10^7
247.	U-230[2]	1×10^1	1×10^5
248.	U-231	1×10^2	1×10^7
249.	U-232[2]	1×10^0	1×10^3
250.	U-233	1×10^1	1×10^4
251.	U-234	1×10^1	1×10^4
252.	U-235[2]	1×10^1	1×10^4
253.	U-236	1×10^1	1×10^4
254.	U-237	1×10^2	1×10^6

No.	Radionuclide	Activity concentration ($kBq \cdot kg^{-1}$)	Activity (Bq)
255.	U-238[2]	1×10^1	1×10^4
256.	U-239	1×10^2	1×10^6
257.	U-240	1×10^3	1×10^7
258.	U-240[2]	1×10^1	1×10^6
259.	Np-237[2]	1×10^0	1×10^3
260.	Np-239	1×10^2	1×10^7
261.	Np-240	1×10^1	1×10^6
262.	Pu-234	1×10^2	1×10^7
263.	Pu-235	1×10^2	1×10^7
264.	Pu-236	1×10^1	1×10^4
265.	Pu-237	1×10^3	1×10^7
266.	Pu-238	1×10^0	1×10^4
267.	Pu-239	1×10^0	1×10^4
268.	Pu-240	1×10^0	1×10^3
269.	Pu-241	1×10^2	1×10^5
270.	Pu-243	1×10^3	1×10^7
271.	Th-234[2]	1×10^3	1×10^5
272.	Pu-244	1×10^0	1×10^4
273.	Am-241	1×10^0	1×10^4
274.	Am-242	1×10^3	1×10^6
275.	Am-242 m^2	1×10^0	1×10^4
276.	Am-243[2]	1×10^0	1×10^3
277.	Cm-242	1×10^2	1×10^5
278.	Cm-243	1×10^0	1×10^4
279.	Cm-244	1×10^1	1×10^4

No.	Radionuclide	Activity concentration (kBq · kg^{-1})	Activity (Bq)
280.	Cm-245	1×10^{0}	1×10^{3}
281.	Cm-246	1×10^{0}	1×10^{3}
282.	Cm-247	1×10^{0}	1×10^{4}
283.	Cm-248	1×10^{0}	1×10^{3}
284.	Bk-249	1×10^{3}	1×10^{6}
285.	Cf-246	1×10^{3}	1×10^{6}
286.	Cf-248	1×10^{1}	1×10^{4}
287.	Cf-249	1×10^{0}	1×10^{3}
288.	Cf-250	1×10^{1}	1×10^{4}
289.	Cf-251	1×10^{0}	1×10^{3}
290.	Cf-252	1×10^{1}	1×10^{4}
291.	Cf-253	1×10^{2}	1×10^{5}
292.	Cf-254	1×10^{0}	1×10^{3}
293.	Es-253	1×10^{2}	1×10^{5}
294.	Es-254	1×10^{1}	1×10^{4}
295.	Es-254 m	1×10^{2}	1×10^{6}
296.	Fm-254	1×10^{4}	1×10^{7}
297.	Fm-255	1×10^{3}	1×10^{6}

[1] Potassium salts in quantities less than 1 000 kg are exempted.
[2] Parent radionuclides, and their progeny whose dose contributions are taken into account in the dose calculation (thus requiring only the exemption level of the parent radionuclide to be considered), are listed in Table 5.

Table 5. Parent radionuclides and their progeny

No.	Parent radionuclides	Progeny
1.	Sr-90	Y-90
2.	Zr-93	Nb-93 m
3.	Zr-97	Nb-97

No.	Parent radionuclides	Progeny
4.	Ru-106	Rh-106
5.	Ag-108 m	Ag-108
6.	Cs-137	Ba-137 m
7.	Ba-140	La-140
8.	Ce-144	Pr-144
9.	Pb-210	Bi-210, Po-210
10.	Pb-212	Bi-212, Tl-208 (0,36), Po-212 (0,64)
11.	Bi-212	Tl-208 (0,36), Po-212 (0,64)
12.	Rn-220	Po-216
13.	Rn-222	Po-218, Pb-214, Bi-214, Po-214
14.	Ra-223	Rn-219, Po-215, Pb-211, Bi-211, Tl-207
15.	Ra-224	Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0,36), Po-212 (0,64)
16.	Ra-226	Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210
17.	Ra-228	Ac-228
18.	Th-226	Ra-222, Rn-218, Po-214
19.	Th-228	Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0,36), Po-212 (0,64)
20.	Th-229	Ra-225, Ac-225, Fr-221, At-217, Bi-213, Po-213, Pb-209
21.	Th-234	Pa-234 m
22.	U-230	Th-226, Ra-222, Rn-218, Po-214
23.	U-232	Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0,36), Po-212 (0,64)
24.	U-235	Th-231
25.	U-238	Th-234, Pa-234 m
26.	U-240	Np-240 m
27.	Np-237	Pa-233
28.	Am-242 m	Am-242

No.	Parent radionuclides	Progeny
29.	Am-243	Np-239

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REFERENCE LEVELS FOR PUBLIC EXPOSURE

1. Reference levels for public annual effective doses without prejudice to reference levels set in [5.8] for equivalent doses, are these:

1.1. 1–20 mSv – for existing exposure situations;

1.2. 20–100 mSv – (acute or annual) for emergency exposure situations.

2. A reference level below ranges referred to in point 1 may be set by the order of the Minister of Health, in particular:

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

2.2. a reference level below 1 mSv per year may be set, where appropriate, in an existing exposure situation for specific source-related exposures or pathways of exposure (exposure from naturally occurring radioactive materials etc.)

3. For the transition from an emergency exposure situation to an existing exposure situation, upon the termination of long-term countermeasures such as relocation, reference level is 20 mSv per year.

4. Considering emergency and existing exposure situations, radiation protection requirements and societal criteria and upon identifying one of the reference levels as specified in this para., the following actions shall be taken:

4.1. $\leq$ 1 mSv per year – general information on the level of exposure shall be provided to members of the public, without specific consideration of individual exposures;

4.2. $\leq$ 20 mSv per year –information about exposures received and available actions to reduce exposures shall be provided to members of the public, without specific consideration of individual exposures;

4.3. $\leq$ 100 mSv per year – assessment of individual doses and specific information on radiation risks and on available actions to reduce exposures shall be provided to members of the public.

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DOSE LIMITS AND STANDARD VALUES AND RELATIONSHIPS USED TO ASSESS EFFECTIVE AND EQUIVALENT DOSES

1. Dose limits for workers, apprentices, students and members of the public are set in the table 1.

Table. Dose limits for workers, apprentices, students and members of the public

	Dose limits for workers, mSv	**Dose limits for apprentices and students, mSv**		**Dose limits members of the public, mSv**
		Aged between 16 and 18 years	**Aged 18 years or over**	
Annual effective dose	20[1]	6	20[1]	1
Annual equivalent dose for the lens of the eye	20[2]	15	20[2]	15
Annual equivalent dose for the skin	500[3]	150[3]	500[3]	50[3]
Annual equivalent dose for the extremities (hands and feet)	500	150	500	-

[1]However, in special circumstances, a higher effective dose of up to 50 mSv may be authorized by the regulatory body in a single year, provided that the average annual dose over any five consecutive years, including the years for which the limit has been exceeded, does not exceed 20 mSv.

[2]The limit of equivalent dose may be up to 100 mSv in any five consecutive years subject to a maximum dose of 50 mSv in a single year.

[3]The limit of the equivalent dose is applied to the dose averaged over any area of 1 cm^2, regardless of the area exposed.

2. Coefficients, standard values and relationships for the estimation of effective and equivalent doses:

2.1. effective and equivalent doses from external exposure are estimated by measuring appropriate dose equivalents established by ICRP;

2.2. corresponding dose equivalents measured in accordance with conservatism principle are equal to the effective or equivalent doses from external exposure. In order to evaluate the effective or equivalent doses from external exposure as accurately as possible, it may be appropriate to use Fig. 5.1–5.9 of chapter 5 of ICRP Publication No. 116, which illustrates the relationships between the effective or equivalent dose and the corresponding measured dose equivalents, depending on the type of exposure, energy and geometry;

2.3. values for estimation of effective dose from external exposure:

2.3.1. personal dose equivalent Hp(10) is assessed with individual dosemeters worn on the human body;

2.3.2. ambient dose equivalent of H*(10) or its rate shall be measured in the workplaces or living environment;

2.4. values for the estimation of equivalent doses for skin or extremities from external exposure:

2.4.1. personal dose equivalent Hp(0,07) shall be measured with the individual dosimeter worn on the human body to evaluate the equivalent dose for skin or the individual dosimeter worn on the human limb to evaluate the equivalent dose for extremities;

2.4.2. directional dose equivalent H'(0.07, Ω) or its rate is measured to evaluate the equivalent dose for skin or extremities in the workplaces and living environment;

2.5. values for the estimation of equivalent doses for the lens of the eye:

2.5.1. personal dose equivalent Hp(3) is measured with the individual dosimeter near the eye;

2.5.2. directional dose equivalent H'(3, Ω) or its rate is measured in the workplaces and living environment;

2.6. committed effective dose from internal exposure due to the radionuclide entering the body in a certain manner may be calculated multiplying the value of the radionuclide intake by appropriate committed effective dose coefficient (e) for that radionuclide intake. These coefficients for the calculation of the committed effective dose are given in the Annexes of ICRP Publication No. 119:

2.6.1. Effective dose coefficients (e) for inhaled particulates for workers are given in table A.1 of Annex A of ICRP Publication No. 119. There are covered different lung clearance types: fast (F), moderate (M), slow (S)and f_1 values for the activity fraction that comes from lungs to gastrointestinal tract from an ingested radionuclide, taking in to account different gastrointestinal absorption coefficients f_1;

Radionuclide compounds and f_1 values used for the calculation of ingestion dose coefficients for workers are given in table D.1 of Annex D of ICRP Publication No. 119;

2.6.3. Radionuclide compounds, lung clearance types and fractional absorption in the gastrointestinal tract f_1 values for the calculation of committed effective dose coefficients are given in the table E.1 of Annex E of ICRP Publication No. 119;

2.6.4. Effective dose coefficients (e) for ingestion of radionuclides for members of the public, taking in to account their age and different values of fractional absorption in the gastrointestinal tract f_1 are given in the table F.1 of Annex F of ICRP Publication No. 119;

2.6.5. Effective dose coefficients (e) for inhalation of radionuclides for members of the public, taking in to account their age, different lung clearance types: fast (F), moderate (M), slow (S) and different values of fractional absorption in the gastrointestinal tract f_1 are given in the table G.1 of Annex G of ICRP Publication No. 119;

2.6.6. Effective dose coefficients (e) for inhalation of soluble or reactive gases for workers are given in the table B.1 of Annex B of ICRP Publication No. 119;

2.6.7. Effective dose rate coefficients ($\dot{e}$) for exposure of workers or adult members of the public to airborne concentration of inert gases are given in the table C.1 of Annex C of ICRP Publication No. 119;

2.7. In order to ensure compliance with the effective dose limit values given in Table 1 of this Annex, they shall be compared with the sum of the effective doses from external exposure over a period of time and the committed effective doses from internal exposure over the same period. In this case, the effective dose E is calculated using the formula:

$$E \cong H_p(10) + \sum_j e(g)_{j,pr} I_{j,pr} + \sum_j e(g)_{j,ik} I_{j,ik}$$

Where:

$H_{ip}\ (10)$ – personal dose equivalent from external exposure, measured over a certain period of time (e. g. one year), Sievert (Vs.);

$e(g)_{j,pr}$ *ir* $e(g)_{j,ik}$ – committed effective dose coefficients for *j* radionuclide intake, inhaled or ingested *j* radionuclide, Sievert Becquerel (Sv/Bq);

$I_{j,pr}$ *ir* $I_{j,ik}$– intakes of radionuclides that entered the body for the same period of time as *j* radionuclides ingested and inhaled, Becquerel (Bq);

2.8. in other cases (carrying two individual dosimeters, evaluating the dose for the lens of the eye, etc.), the effective and equivalent doses shall be calculated in accordance with procedures agreed with the regulatory body.

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(Standard form of the Passbook of Outside Worker's Exposure)

RADIATION PROTECTION CENTRE	
Radiation Protection Centre, Kalvariju St. 153, LT-08352 Vilnius	
PASSBOOK OF OUTSIDE WORKER'S EXPOSURE	
_____ (date)	No. _____

Shall be filled up by the Radiation Protection Centre

1. Data about the outside worker		
1.1. Name	1.2. Surname	
1.3. Other Surnames (including Maiden Name)		
1.4. Date of Birth (Year, Month, Day)		
1.5. Identification Number (According to the Register)		
Sex	☐ Female	☐ Male
Category of worker	☐ A	☐ B
2. State of health of A category outside worker		
2.1. Conclusions of health examination ☐ Suitable to work	☐ Suitable to work under special conditions	☐ Unsuitable to work
2.2. Information about restrictions on working with ionizing radiation:		
2.3. Name of the health institution where the health examination was carried out:		
2.4. Date of last health examination (Year, Month, Day) Valid for 1 year		
3. 3. Data about the employer of outside worker		
3.1. Name / name, surname		
3.2. Code of legal / natural person		
3.2. Address		
3.3. Phone		
3.5. E-mail address		

4. Registered exposure dose received during the last 5 years

Year	4.1. External exposure, mSv					4.2. Internal exposure			4.3. Total effective dose, E, mSv
	$H_p(10)_1$ or effective dose	Neutrons $H_p(10)_2$	Skin $H_p(0.07)$	Extremities $H_p(0.07)$	Eye lens $H_p(3)$	Committed effective dose, E(50), mSv	Radionuclide	Intake, Bq	
1	2	3	4	5	6	7	8	9	10

Explanations:

$H_p(10)_1$ – personal dose equivalent for measurement of X-ray and gamma radiation. $H_p(10)_{above}$ – measured above the personal protection measure and $H_p(10)_{under}$ – measured under the personal protection measure.
$H_p(0.07)$ – personal dose equivalent for measurement of X-ray, gamma and beta radiation.
$H_p(3)$ – personal dose equivalent for measurement of X-ray, gamma and beta radiation.

$H_p(10)_2$ – personal dose equivalent for measurement of neutron radiation.

_____	_____	_____
(Job title)	(signature)	(Name, Surname)

A. V.

Shall be filled up by the undertaking accepting outside worker

5. Data about the undertaking accepting outside worker
5.1. Name / name, surname
5.2. Code of legal / natural person
5.3. Address
5.4. Phone
5.5. E-mail address
6. Data about person, responsible for radiation protection
6.1. Name
6.2. Surname
6.3. Phone
6.4. E-mail address

7. Data about exposure doses of outside worker _____ (Name and Surname)											
Year	7.1. External exposure, mSv							7.2. Internal exposure			7.3. Total effective dose, E, mSv
	$Hp(10)_1$ or effective dose	$Hp(10)_{above}$	$Hp(10)_{under}$	Neutrons $Hp(10)_2$	Skin Hp (0.07)	Extre-mities Hp (0.07)	Eye lens Hp (3)	Committed effective dose, E(50), mSv	Radio-nuclide	Intake, Bq	
1	2	3	4	5	6	7	8	9	10	11	12

8. Start date of work of outside worker
9. End date of work of outside worker

Data compiled by:

_____	_____	_____
(Job title)	(signature)	(Name, Surname)

A. V.

Note. Employer of outside worker shall send back this document to Radiation Protection Centre within 10 working days after the outside worker has finished work and after receiving the Passbook of outside worker‘s exposure from the undertaking accepting outside worker. If the worker didn‘t start the

work within 3 months after the Passbook of outside worker‘s exposure was issued, this document has to be sent back to the Radiation Protection Centre.

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LIST OF PRACTICES INVOLVING NON-MEDICAL IMAGING EXPOSURE

1. Types of practices involving non-medical imaging exposure using medical radiological equipment:

1.1. radiological health assessment for employment purposes of natural persons if such examination is not provided for by the legislation regulating the preventive examination of the health of employed persons, or it does not comply with the periodicity of the examination prescribed therein;

1.2. radiological health assessment for immigration purposes;

1.3. radiological health assessment carried out by the request of the insurer for insurance purposes;

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

1.5. for age assessment;

1.6. court-ordered radiological examinations in the absence of clinical indications;

1.7. the identification of concealed objects within the human body;

1.8. health assessment for other purposes than of diagnosis and / or treatment of disease and for health improvement.

2. Types of practices involving non-medical imaging exposure using other than medical radiological equipment:

2.1. for detection of concealed objects on or attached to the human body (scanning people);

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

2.3. other types of practices involving the use of ionising radiation for legal or security purposes.

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CONTENT OF RADON RISK MANAGEMENT ACTION PLAN

1. Program for conducting surveys of indoor radon activity concentrations or soil gas activity concentrations with the purpose of estimating the distribution of indoor radon activity concentrations, for the management of measurement data and data keeping, for the establishment of other relevant parameters for indoor radon activity concentration estimation (for example, soil and rock types, permeability and ^{226}Ra activity concentration of rock or soil).

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

3. Order of identification of workplaces, including underground workplaces, and buildings with public access (schools, etc.) and workplaces and buildings with public access in radon risk areas, where measurements are required, on the basis of a radon risk assessment, considering occupancy hours.

4. Determined reference levels for dwellings and workplaces. In case when different reference levels for different uses of buildings (dwellings and buildings with public access, workplaces), are established as well as for existing and for new buildings, justification of its' determination.

5. Measures for reducing radon exposure in dwellings and for giving priority to dwellings where radon causes high exposure.

6. Order for facilitating post construction remedial action.

7. Description of methods and tools for preventing radon ingress in new buildings, identification of building materials with significant radon exhalation those need to be assess regarding radiation protection issues as well.

8. Means for communication to increase public awareness and inform according the competencies the implementers of the measures envisaged in the Radon Risk Management Action Plan, employers and employees of the risks of radon to health, including in relation to smoking.

9. Recommendations on radon measurement methods and tools for remedial measures. Requirements for recognition of measurement and remediation services.

10. Where appropriate, order for provision of financial support for radon surveys and for implementation of remedial measures, in particular for private dwellings with highest radon concentrations.

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

12. Consideration of other related issues and corresponding programmes such as programmes on energy saving and indoor air quality.

13. Implementers of measures under the Radon Risk Management Action Plan, funding for their implementation, and arrangements for coordinating the implementation of the measures in the Radon Risk Management Plan.

14. Schedules for reviews of Radon Risk Management Action Plan.

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LIST OF BUILDING MATERIALS, WHICH SHALL BE RADIOLOGICALLY INVESTIGATED

1. Natural materials:
1.1. alum-shale;
1.2. building materials or additives of natural igneous origin, such as:
1.2.1. granitoides (such as granites, syenite and orthogneiss);
1.2.2. porphyries;
1.2.3. tuff;
1.2.4. pozzolana (pozzolanic ash);
1.2.5. lava.
2. Building materials incorporating residues from industries processing naturally occurring radioactive materials, such as:
2.1. fly ash;
2.2. phosphogypsum;
2.3. phosphorus slag;
2.4. tin slag;
2.5. copper slag;
2.6. red mud (residue from aluminium production);
2.7. residues from steel production.

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LIST OF TYPES OF EXISTING EXPOSURE SITUATIONS

1. Existing exposure situation when exposure is caused due to contamination of areas by residual radioactive material from:

1.1. past activities that were never subject to regulatory control or were not regulated in accordance with the requirements of radiation protection;

1.2. transition from the emergency exposure situation to existing exposure;

1.3. residues from past activities for which the legal person, other organization or their branch has been liquidated or reorganized or the individual performing practise has died.

2. Existing exposure situation when exposure is caused due to natural radiation sources, including:

2.1. indoor exposure to radon and thoron, in workplaces, dwellings and buildings with public assess;

2.2. indoor external exposure from radionuclides in building materials.

3. Existing exposure situation when exposure is caused due to commodities (excluding food, animal feeding stuffs and drinking water):

3.1. radioactive materials from contaminated areas specified in point 1 of this Annex;

3.2. naturally-occurring radionuclides.

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(Form of Standard record sheet for high activity sealed radioactive sources)

STANDARD RECORD SHEET FOR HIGH ACTIVITY SEALED RADIOACTIVE SOURCES

1. High activity sealed radioactive sources (hereinafter – DAURŠ) identification number: .....

Manufacturer device number[1]: .....

Field of use[1]: .....

.....

2. Identification of the licensed undertaking

Name: .....

Address: .....

Country: .....

Manufacturer ☐ Supplier ☐ User ☐

3. Location of DAURŠ (use and storage pace) if not the same as in paragraph 2

Name: .....

Address: .....

Country: .....

Fixed use ☐ Mobile use ☐

Used ☐ Storage ☐

4. Recording

Date of start to recording: .....

Date of end to recording: .....

5. Information of license or temporary permit:

Number: .....

Date of issue: .....

6. Technical maintenance of DAURŠ

Date: .....

Date: .....

Date: .....

Date: .....

Date: .....

Date: .....

Date: .....

Date: .....

Date: .....

Date: .....

7. DAURŠ characteristics

Date of manufacture[1]: .....

Radionuclide: .....

Activity at the date of manufacturing: ..... GBq

Activity reference date: ..... GBq

Manufacturer/ supplier[2]: .....

Name: .....

Address: .....

Country: .....

Physical and chemical characteristics

DAURŠ type[1]: .....

DAURŠ capsule identification[1]: .....

ISO clasification[1]: .....

ANSI clasification[1]: .....

DAURŠ category[1]: .....

Neutron source[1]: Yes ☐ No ☐

Neutron source target[1]: .....

Neutron flux[1]: .....

8. Receipt of DAURŠ

Date of receipt: .....

Receipt from:

Name: .....

Address: .....

Country: .....

Manufacturer ☐ Supplier ☐ Another user ☐

9. Transfer of DAURŠ

Date of transfer: .....

Transfer to:

Name: .....

Address: .....

Country: .....

License or temporary permit number: .....

Date of issues: .....

Manufacturer ☐ Supplier ☐ Another user ☐

Facility for long term storage ☐ Disposal ☐

10. Further information

Loss ☐ Date of loss: .....

Theft ☐ Date of theft: .....

Findings[1]: Yes ☐ No ☐

Date[1]: .....

Place[1]: .....

Other information[1]: .....

.....

.....

.....

[1] Optional field.

[2] If the manufacturer of DAURŠ is not established in a Member State of the European Union or in a State of the European Economic Area, the name and address of the importer and / or the supplier may be indicated.