Ministerial Decree 16/2000 (VI. 8.) EüM of the Minister of Health on the Implementation of Certain Provisions of the Act CXVI of 1996 on Atomic Energy

On the basis of the mandate given by the Act CXVI of 1996 on Atomic Energy (hereinafter referred to as the Act on AE) in its Section 68, Subsection (2), Paragraphs a) to e), k) to o), as well as by the Act XCIII of 1990 on Dues, Section 67, Subsection (2), – in agreement with the concerned Ministers – I order the following:

Section 1

(1) This Decree, in accordance with the Act on AE, Article 20, Paragraphs a) to f) and h) – with the exception of cases described in Subsection (2) – shall apply to all materials, equipment, facilities falling within the application of the atomic energy, as well as all the activities and persons associated with them.

(2) This Decree shall not apply

a) the nuclear facilities, their buildings, systems and equipment – with the exception established in Subsection (3) – and the activities and persons associated with them, and

b) the issues related to defence related tasks determined in the Act on AE, Article 26.

(3) This Decree shall apply to the persons mentioned in Subsection (2), Paragraph a), with respect to activities defined in

a) the Act on AE, Article 68, Subsection (2), Paragraphs a) and c), as well as Paragraph e),

b) the Act on AE, Article 68, Subsection (2), Paragraph k).

Section 2

The terms used in this Decree, as well as the basic principles and requirements of radiation protection are defined in Annex 1.

Limitation of the exposure to ionising radiation of the employees and of the population, intervention levels associated with the radiation dose in the case of a nuclear emergency

(with reference to the Act on AE, Article 68, Subsection (2), Paragraph a))

Section 3

The dose limits for the employees and for the population, the action levels for the radon concentrations in working places, the system of external and internal radiation monitoring of the individuals exposed, the intervention levels to be considered in the Emergency Response Plans, as well as the rules to be applied for the radiation protection of the personnel participating in the mitigation of the consequences of a nuclear accident are described in Annex 2.

Radiation protection qualification

(with reference to the Act on AE, Article 68, Subsection (2), Paragraph b))

Section 4

(1) Any equipment, falling within the application of the atomic energy, emitting ionising radiation or containing radioactive source,, as well as any protective means used for the protection against radiation (hereinafter referred together as: equipment) can be put on the market or operated only if the suitability of the equipment (or its prototype, in case of serial production) is qualified and certified from the radiation protection point of view by the Office of the Chief Medical Officer of State of the National Public Health and Medical Officer's Service (hereinafter Office of CMOS), based on the expert's opinion of the 'Frédéric Joliot-Curie' National Research Institute for Radiobiology and Radiation Hygiene (hereinafter referred to as NRIRR). The equipment provided with CE mark are qualified via their registration.

(2) If an enterprise having only foreign residence and foreign site transports the equipment defined in Paragraph (1) to Hungary exclusively for its own use only for the period of its activity, and subsequent to the completion of the activity but at least within ten days transport the equipment out of Hungary, then the use of

the equipment can be licensed based on the manufacturer declaration issued to the CE mark. The registration of the equipment type in Hungary is not a requirement for granting the license.

(3) The application form for radiation protection qualification, as well as the requirements for the radiation protection qualification are given in Annex 3.

Section 5

(1) The radiation protection qualification is initiated by

a) the manufacturer,

b) the distributor (if the equipment is imported),

c) the user (if the equipment is not circulated within the internal trade).

(2) If any radiation protection related property of the qualified equipment is affected by the maintenance, repair or reconstruction, the radiation protection qualification must repeatedly be performed.

Section 6

The list of the equipment qualified as suitable from radiation protection point of view is published electronically and updated quarterly by the NRIRR.

Occupational aptitude criteria applicable for the employees

(with reference to the Act on AE, Article 68, Subsection (2), Paragraph c))

Section 7

For employees occupied within the scope of the application of atomic energy the occupational aptitude criteria are defined in a separate law.

The order of the radiation protection training

(with reference to the Act on AE, Section 68, Subsection (2), Paragraph c))

Section 8

(1) The acquisition of the knowledge on radiation protection must be provided within the framework of training and retraining.

(2) Any working activity falling within the scope of the application of atomic energy can be performed only by a person who took part in radiation protection training and retraining of examination liability and successfully passed that examination, as detailed in Annex 4. Untrained person is allowed to do the work under the supervision of another person with due qualification until the examination is completed but not exceeding one year.

(3) The topics of the radiation protection training and retraining and the examination requirements on the basic level are to be accepted by the territorially competent Radiation Health De-centre (hereinafter Radiation Health De-centre) of the ÁNTSZ). The listing and territorial competence of the Radiation Health De-centres is contained in the Subsection 1 of Annex 7. In case of extended and comprehensive education in radiation protection the list of trainers, the topics of the training and retraining and the examination requirements are to be accepted by the Office of CMOS, based on the proposals of the NRIRR.

(4) The provision of participation in the radiation protection training and retraining and its administration is the duty of the licensee.

(5) Exemption from the radiation protection training and retraining liability cannot be granted.

(6) The radiation protection qualification of an external worker from a Member State of the European Economic Area (ECA) or from a State having the same legal status as an ECA State based on international agreement concluded with the European Union can be certified by an English document issued abroad according to a separate law. The Radiation Health De-centre issuing the work permit for the external worker judges the appropriateness of the qualification on the basis of the expert opinion of the NRIRR.

The basic requirements of the occupational radiation protection, radiation hygienic and working rules applicable for the employees

(with reference to the Act on AE, Section 68, Subsection (2), Paragraph c) and e))

Section 9

(1) The basic requirements of the occupational radiation protection are detailed in Annex 5.

(2) For the protection of the employees occupationally exposed to ionising radiation, - depending on the classification of the workplace and the working conditions - workplace monitoring (defined in Annex 5) and personal monitoring (defined in Annex 2) must be provided.

(3) If the radiation level justifies, the competent Radiation Health De-centre shall order the regular monitoring of personal exposure and determines its manner at work-places entailing increased exposure from natural sources as determined in Appendix 2 of Annex 2.

Radiation Protection Service

(with reference to the Act on AE, Section 68, Subsection (2), Paragraph e))

Section 10

(1) The licensee is obliged to establish a Radiation Protection Service and to provide all personnel and material means necessary to operate it.

(2) The Radiation Protection Service prepares the Workplace Radiation Protection Regulations (hereinafter Workplace RPR). The detailed requirements for the Workplace RPR are given in Annex 6. The Workplace RPR is to be approved by the Radiation Health De-centre), with the exception of the special facilities, as defined in Subsection A/12 of the Annex of Annex 7, in which case the Workplace RPR is to be approved by the Office of CMOS, based on the expert's opinion of the NRIRR.

(3) The personnel of the Radiation Protection Service monitors if the doses to the employees working in the given facility as well as the radiation protection status of the area and of the nearby environment of the facility complies with the conditions defined in this Decree, in separate legal regulations and in the Workplace RPR.

(4) The tasks of the Radiation Protection Service are defined in details in the Workplace RPR, taking into consideration the requirements of Annex 8.

Section 11

(1) The Radiation Protection Service – with the exception of cases in Subsections (2) and (6) – is composed of at least a radiation protection officer and of his/her deputy.

(2) The Radiation Protection Service is composed of at least a radiation protection officer, if the work-place is categorized as III A or IIIB according to the Appendix of Annex 7.

(3) The radiation protection qualification of the radiation protection officer must be equal to the highest qualification required for the employees of the organisational unit, as given in Annex 4.

(4) The radiation protection officer and his/her deputy are commissioned by the employer with a written assignment.

(5) The structure and functioning of the Radiation Protection Service is supervised by the Radiation Health De-centre or by the Office of CMOS.

(6) In a nuclear facility – in cases defined by the Office of CMOS - the tasks of the Radiation Protection Service are carried out by the Radiation Protection Section. The licensee notifies the Office of CMOS about the assignment of the head of the Radiation Protection Section.

Radiation protection criteria applicable for public road transportation vehicles

(with reference to the Act on AE, Section 68, Subsection (2), Paragraph d))

Section 12

(1) The undertaking for a vehicle transporting radioactive material (hereinafter vehicle) shall ensure that the vehicle or the equipment complies with the radiation protection requirements specified in the Annexes A and B of the European Agreement concerning the International Carriage of Dangerous Goods by Road (hereinafter ADR), proclaimed by the Law Decree No. 19/1979, as well as in Annex 9 of this Decree.

(2) The certificate of compliance for the vehicle is issued by the Radiation Health De-centre on the request of the operator.

(3) The certificate is valid for 4 years. The validity of the certificate can be extended if requested within 30 days after the expiry date, and if the vehicle is presented for a revision. If the extension is not requested within the given period then a new certificate must be obtained.

(4) The certificate of compliance must contain the following information:

a) the type and license number of the vehicle and its trailer, if it is applicable,

b) the classification of the transportable radioactive materials, according to ADR, together with the UN number,

c) the special conditions of the transportation.

Licensing, supervision

(with reference to the Act on AE, Section 68, Subsection (2), Paragraphs k), l) and m))

Section 13

The licensing procedures, as defined in the Act on AE, Section 20, Subsection (1), Paragraphs a) to c), are in the competence of the Radiation Health De-centre or the Office of CMOS.

Section 14

(1) The Radiation Health De-centre issues license on the first level for

a) radioactive material

aa) storage,

ab) application and use,

ac) transformation;

b) non-nuclear facilities and equipment performing the activities in aa) to ac)

ba) establishment, production,

bb) operation – including maintenance -, putting into operation,

bc) transformation and repair,

bd) terminating operation and dismantling;

c) ionising radiation generating equipment

ca) production, transformation,

cb) operation – including maintenance -,

cc) terminating operation,

d) facility serves for the production, operation of equipment defined in Paragraph c)

da) establishment,

db) operation.

dc) modification,

dd) termination.

(1a) The installation of equipment and instrument categorized to III A according to the Appendix of Annex 7 does not require regulatory licensing. Delivery of radioactive sources and equipment containing radiative sources require the storage license from the Radiation Health De-centre.

(2) The Office of CMOS issues license on the first instance for the production and distribution of radioactive materials.

(3) The license defined in Subsection (1) – according to the content of the license – is valid for the given workplace, institution or the territory for which the competence of the issuing Radiation Health De-centre extends. For the activities falling into the categories defined in Subsection (1) the Office of CMOS is authorised to provide territorial extension of the licences beyond the territory of competence of the Radiation Health De-centre on the request of the licensee.

(4) The construction licensing procedure can be initiated after the licenses described in Subsection (1), Paragraphs b) and d) are received.

Section 15

The license for the use of ionising radiation in the county institute is issued by the Office of CMOS.

Section 16

(1) The user of the atomic energy submits a request for issuing a license, in which request the

data described in Annex 10 must be provided.

(2) The Radiation Health De-centre or the Office of CMOS issues the license depending on the compliance of the request with the binding conditions defined in this Decree. The Office of CMOS is authorised to provide territorial extension of the licences beyond the territory of competence of the Radiation Health De-centre.

(3) When applying for a license to establish facilities performing practices described in Section 14, Subsection (1), Paragraphs b) and d) a radiation

protection and radiation safety plan and description, prepared by a radiation protection specialist, must be attached, with the exception of work places categorized as III A according to the Appendix of Annex 7.

(4) If the license of the practice defined in Section 14, Subsection (1), Paragraph ab) is issued for the use of open radioactive substance outside laboratory conditions the provisions of Subsection (3) must be applied, as applicable.

Section 17

(1) The NRIRR provides expert's opinion about the radiation protection and radiation safety plans prepared for

a) the establishment of special facilities defined in the Appendix of Annex 7,

b) the establishment of medical therapeutic irradiation facilities, industrial accelerators and large irradiation facilities,

c) the establishment of isotope laboratories aimed at the production of radioactive substances,

d) the introduction of use of open radioactive substances outside laboratory conditions.

(2) The operation license for facilities established based on plans evaluated by the NRRIR is issued by the Radiation Health De-centre, based on site inspection conducted jointly with NRRIR and the expert opinion of NRRIR.

(3) The evaluation of the radiation protection and radiation safety plans of nuclear facilities not listed in Sub-section (1), as well as the licensing of their establishment and commissioning is performed by the Radiation Health De-centre.

Section 18

Cancelled

Section 19

The validity periods of the licenses of facilities listed in the Appendix of Annex 7 are as follows:

a) 2 years in case of special facilities,

b) 3 years in case of category I facilities,

c) 5 years in case of category II facilities,

d) 8 years in case of category III A and B facilities

Section 20

(1) The Radiation Health De-centres performs full scope supervision on the licensed facilities under their territorial competence with the frequency given in Subsection 2 and the Appendix of Annex 7.

(2) The Office of CMOS performs full scope supervision, with the frequency given in Subsection 2 of Annex 7on work units of the county institutes that apply ionising radiation, on practices of the nuclear facilities that fall within the scope of the Act on AE, Section 68, Subsection (2), Paragraph k) as well as on those who perform such practices, according to the Act on AE, Section 68, Subsection (2), Paragraph a), c) and e).

Section 21

(1) In case of violation of this Decree and incompliance with the provisions of the license - the Radiation Health De-centre or the Office of CMOS is authorised to withdraw the license or to suspend it for a definite time period.

(2) The Radiation Health De-centre or the Office of CMOS notifies the licensee in a decision about the duration of the license suspension and about the measures to be taken during this period.

(3) After the expiry of the license suspension period without the resolution of the deficiencies the Radiation Health De-centre or the Office of CMOS withdraws the license.

Section 22

(1) The license according to Section 14, as well as the decision about its withdrawal must be sent to the Hungarian Atomic Energy Authority (hereinafter HAEA), as well as to the NRIRR. In case of a radiation generating equipment, whose do not contain radioactive material, the resolution need not be sent to the HAEA.

(2) The Radiation Health De-centres maintain electronic records, which is harmonized with NRRIR, on the radioactive materials, equipment generating ionizing radiation, work-places and activities listed in Subsection (1) of Section 14.

Clearance from regulatory control

Section 23

(1) The clearance from the regulatory control is issued by the Office of CMOS. The licensee attaches to the request an estimate of the doses originating from the use, re-use, re-utilisation of the substance or its handling as non-radioactive waste, as well as an analysis concluding that the clearance is the optimum solution.

(2) Substances containing radionuclides can be released from regulatory control if

a) the projected annual individual dose originating from its re-use, re-utilisation or its handling as non-radioactive waste does not exceed 30 μSv effective dose, and

b) the analysis proves that the clearance is the optimum solution.

(3) In its resolution the Office of CMOS may imply conditions concerning the use, re-use, re- utilisation of the substance or its handling as non-radioactive waste.

(4) For the communication of the decision as per Subsection (1) the rules of Section 22, Subsection (1) shall be applied.

(5) For radionuclide containing substances released from the regulatory control the further provisions of this Decree shall not be applied.

Termination

Section 24

(1) On the request of the licensee the competent Radiation Health De-centre or the Office of CMOS withdraws the license.

(2) In case of withdrawal as per Subsection (1) the licensee is obliged to report the intended termination of the practice, installation or equipment at least 30

days before the planned date of termination to the competent Radiation Health De-centre or to the Office of CMOS.

(3) The termination procedure is initiated officially by the competent Radiation Health De-centre or by the Office of CMOS, if the validity of the license has expired and the licensee has not requested its extension or termination.

(4)

(5) The competent Radiation Health De-centre or the Office of CMOS conducts the termination procedure and shall send its resolution to the organisations listed in Section 22.

Resolution on utilisation without regulatory control

Section 25

(1) After the completion of the termination procedure - on the basis of on-the-spot inspection - the Radiation Health De-centre decides if the facility defined in Section 14, Subsection (1), Paragraph b) be declared usable without further regulatory control (inactive). The Radiation Health De-centre issues license for the utilization (inactive status) of facilities and areas determined in Paragraph b) of Subsection (1) of Section 14, if it determines in the frame of a site inspection that each radiation source was terminated at the facility or area to be utilized and the level of radiation is not harmful to health. The Radiation Health De-centre communicates the adopted resolution to the Office of CMOS.

(2) In its resolution on utilisation the Radiation Health De-centre defines what type of future use of the facility is excluded from the scope of free utilisation and may imply conditions for re-utilization.

National Radiation Hygiene Preparedness Service

(with reference to the Act on AE, Section 68, Subsection (2), Paragraph n))

Section 26

(1) The determination of duties and the professional supervision of the implementation of the radiation hygienic tasks required for the management of incidents or accidents involving radioactive substances or equipment emitting ionising radiation - with the exception of the incidents occurring in nuclear

facilities and of the nuclear emergency - are the responsibility of the National Radiation Hygiene Preparedness Service of the NRIRR.

(2) The persons not performing activity belonging to the scope of the use of atomic energy, who suspect the presence of orphan radioactive sources, may notify the NRIRR. The NRIRR investigates the notification and performs the necessary measures.

(3) Material means and personnel required for the operation of the National Radiation Hygiene Preparedness Service are provided by the Office of CMOS.

(4) Measures and notification rules applicable in case of found or confiscated radioactive or nuclear materials are given in separate legal regulations.

(5) The management of the nuclear emergency is governed by separate regulations.

(6) The alarming system of the National Radiation Hygiene Preparedness Service and the tasks to be done in case of alarm are published by the Office of CMOS in its communiqué.

Section 27

To support the most efficient intervention in case of emergency the NRIRR keeps a National Registry of the workplaces applying ionising radiation and of the incidents and accidents that have occurred.

Treatment of radiation injured or potentially injured persons

(with reference to the Act on AE, Section 68, Subsection (2), Paragraph o))

Section 28

(1) If a person received an effective dose exceeding 250 mSv (hereinafter radiation injured person), or if such a dose could possibly be received, he/she must immediately be medically examined and treated, if necessary. The person received an effective dose exceeding 250 mSv not from a therapy exposure, or based on clinical symptoms or dose estimation received radiation exposure (absorbed dose) exceeding 6 Gy on a part of the skin, 2 Gy on eye lens or 3 Gy in other organs (hereinafter as radiation injured person), or if the above is suspected, then he/she must immediately, but at least within 24 hours be medically examined and treated, if necessary.

(2) If a person incorporates an open radioactive source, or if such incorporation could possibly occur, the procedure prepared and published in its methodological letter by the NRIRR - in co-operation with the competent professional board - must be followed. The workplace specific radiation protection tasks to be carried out during the procedure are described in the Workplace RPR.

(3) The specialised treatment of radiation injured or potentially injured persons is performed at the designated health institutions listed in Annex 12, with the expert assistance of the NRIRR. The designated health institute establishes a working group, which is able to provide treatment to a combine radiation injured person.

(4) The manager of the designated health institute ensures the radiation medical training of doctors participating in working groups as per (3). The training course is delivered by NRIRR according to the training schedule approved by CMOS.

Section 29

cancelled

Closing provisions

Section 30

(1) This Decree - with the exception of parts specified in Subsection (2) - enters into force 30 days after its announcement.

(2) Paragraphs 2, 12, 16 and 26 in Annex 2 of Annex 2 of this Decree enter into force on January 1, 2003.

(3)-(4) cancelled

(5)-(6) cancelled

(7) In accordance with Section 3 of Act I of 1994, announcing the European Treaty on the association, signed by the Republic of Hungary and the European Union and its member states in Brussels on 16 December 1994, this Decree is in agreement with the regulations of the Council, concerning Directive No. 96/29/EURATOM on the protection of the workers and the public against the ionising radiation.

Annex 1 to the Ministerial Decree 16/2000 (VI. 8.) EüM

Basic radiation protection requirements and glossary of terms

I. BASIC RADIATION PROTECTIONS REQUIREMENTS

1. Practice involving emission of ionising radiation can be licensed and maintained only if it is justified, if the benefit of the practice for the society exceeds the harm that the radiation may cause.

2. In relation to exposures from any particular source within a practice - except for therapeutic medical exposures - protection and safety shall be optimised in order that the magnitude of individual doses, the number of people exposed and the likelihood of incurring exposures all be kept as low as reasonably achievable. Economic and social factors must be taken into account during the optimisation.

3. The total dose originating from artificial sources - except for the radiation dose originating from medical applications - shall not exceed the dose limits defined in this Decree.

II. GLOSSARY

Activity (A)

The quantity A for an amount of radionuclide in a given energy state at a given time, defined as:

$$\mathbf{A = dN/dt,}$$

where dN is the expectation value of the number of spontaneous nuclear transformations from the given energy state in the time interval dt. The unit of activity is the reciprocal second (1/s), termed the becquerel (Bq).

Accidental exposure

Exposure of persons originating from accidental situations, excluding the emergency exposure.

Intervention

Any human activity directed to a source, radiation pathway or the affected individuals to reduce or avert exposure or the likelihood of exposure to sources which are not part of a controlled practice or which are out of control as a consequence of an accident.

Intervention level

The level of the avertable equivalent or effective dose at which the intervention actions must be taken into consideration. The avertable dose or the derived quantity refers exclusively to the radiation pathway or pathways to which the intervention is directed.

Becquerel (Bq)

The name of the unit of activity. One becquerel is equal to one nuclear transformation within a second:

$$\mathbf{1\ Bq = 1\ s^{-1}}$$

Exposure

The condition of being subject to ionizing radiation.

Action level

The level of dose rate or activity concentration above which remedial actions or protective actions should be carried out in chronic exposure or emergency exposure situation.

Deterministic effect

A radiation effect for which generally a threshold level of dose exists above which the severity of the effect is greater for higher dose.

Dose equivalent (H)

A quantity used by the International Commission on Radiation Units and Measurements (ICRU) in defining some operational quantities introduced for certain radiation protection measurements. The quantity dose equivalent has been superseded for radiation protection purposes by equivalent dose.

Dose limit

A value of the total effective dose or committed effective dose, equivalent dose or committed equivalent dose originating from external sources or incorporated radionuclides for a given period of time that the individual doses from controlled sources shall not be exceeded.

Dose constraint

A prospective and source related restriction on the potential individual dose delivered by the source which serves as a bound in the optimisation of the radiation protection in the design phase.

Effective dose (E)

The quantity E is defined as the sum of the weighted equivalent doses (H_T) in the organ or tissue T, summation is being done for the whole human body:

$$\boldsymbol{E = \sum_{T} w_T H_T = \sum_{T} w_T \sum_{R} w_R D_{T,R}}$$

where w_T is the tissue weighting factor for tissue T, w_R is the radiation weighting factor for the radiation type R, $D_{T,R}$ is the average value of the absorbed dose originating from radiation type R and absorbed in the organ or tissue T. The unit of the effective dose is Jkg^{-1}, termed the sievert (Sv). The weighting factors of the different tissues used for radiation protection purposes are as follows:

Tissue or organ	**Weighting factor, wT**
Gonads	0.20
Bone marrow (red)	0.12
Colon*	0.12
Lung	0.12
Stomach	0.12
Bladder	0.05
Breast	0.05
Liver	0.05
Oesophagus	0.05

Thyroid	0.05
Skin	0.01
Bone surface	0.01
Rest**	0.05

* The lower large intestine.

** For the purposes of calculation, the remainder is composed of adrenal glands, brain, the upper large intestine, small intestine, kidney, muscle, pancreas, spleen, thymus and uterus. In those exceptional cases in which the most exposed remainder tissue receives higher committed equivalent dose than all the listed 12 organs, a weighting factor of 0.025 shall be applied to that tissue or organ and a weighting factor of 0.025 to the average dose in the rest of the remainder as defined here.

Health detriment

Estimated risk of the reduction of life expectancy and life quality due to exposure of a group of the population to ionising radiation. It includes the radiation-related damages of the organs and tissues, the tumours and the severe hereditary effects.

Equivalent dose (H_T)

The quantity $H_{T,R}$ is defined as the dose absorbed in the tissue or organ T multiplied with the weighting factor taking the different biological effects of the type and quality of radiation R into account:

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

where w_R is the weighting factor, $D_{T,R}$ is the average value of the absorbed dose in tissue or organ T. When the radiation field is composed of different types of radiation (i.e. radiation with different w_R) the total equivalent dose is defined by the following expression:

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

The unit of the equivalent dose is Jkg^{-1}, termed the Sievert (Sv).

The weighting factors of the types of radiation most frequently occurring in the practice of radiation protection are as follows:

Type and energy range of radiation		**Radiation weighting factor, w_R**
Photons	all energies	1
Electrons and muons	all energies*	1
Neutrons	<10 keV	5
	10 keV-100 keV	10
	>100 keV-2 MeV	20
	>2 MeV-20 MeV	10
	>20 MeV	5
Protons (others than recoil protons)	>2 MeV	5
Alpha-particles, fission fragments, heavy nuclei	-	20

* Excluding Auger electrons emitted from nuclei to DNA, for which special microdosimetric considerations apply.

Equivalent dose rate (H)

The dH increase of the equivalent dose within the time interval dt

$$\boldsymbol{H = \frac{dH}{dt}}$$

The unit of the equivalent dose rate is the Jkg-1s-1), termed the Sievert per second (Svs-1).

Avertable dose

The difference between the dose to be expected with the protective action and that to be expected without it.

Controlled area

An area where, in relation with the radiation protection and the potential radioactive contamination, specific protection measures and safety provisions apply and the access of which is controlled.

Absorbed dose (D)

The fundamental dosimetric quantity D is defined by the expression

$$\boldsymbol{D = \frac{d\varepsilon}{dm}}$$

where dε is the mean energy imparted by ionising radiation to matter in a volume element and dm is the mass of the volume element. Within the scope of the present Decree the absorbed dose is the mean dose averaged over the whole tissue or organ. The unit of the absorbed dose is the joule per kilogram (Jkg-1), termed the gray (Gy).

Absorbed dose rate (D)

The dD increase of the absorbed dose within the time interval dt

$$\boldsymbol{D = \frac{dD}{dt}}$$

The unit of the absorbed dose rate is $Jkg^{-1}s^{-1}$), termed the gray per second (Gys^{-1}).

Sheltering

An intervention action taken in the early phase of a nuclear accident or radiological emergency for the protection of the members of the public. During the course of sheltering the affected population or certain groups of the population shall stay in closed and properly sealed places. The duration of the sheltering - if not regulated otherwise by the competent authority - should not exceed 2 days.

Potential exposure

Exposure that is not expected to be delivered with certainty but the probability of which can be estimated in advance.

Registration level

A level of the dose or radionuclide intake, determined by the competent authority, above which the individual exposure of the employees must be recorded into the appropriate registry.

Supervised area

An area which is under well-defined supervision for the purpose of protection against ionising radiation.

Gray (Gy)

The term denoting the unit of the absorbed dose, the energy imparted by the ionising radiation within the unit mass:

$$\mathbf{1\ Gy = 1\ J\ kg^{-1}}$$

ICRU sphere

A special object, introduced by the ICRU, used for modelling the human body from the point of view of the absorption of the energy of ionising radiation. The diameter of the ICRU sphere is 30 cm, its density is 1 gcm^{-3} and it is composed of tissue equivalent solid material (76.2 mass % oxygen, 11.1 mass % carbon, 10.1 mass % hydrogen and 2.6 mass % nitrogen).

Iodine prophylaxis

Administration of stable iodine compounds for the purpose of decreasing or preventing the uptake of radioactive iodine.

Evacuation

An intervention action that can be taken in the early phase of a nuclear accident or radiological emergency, during which persons exposed to the danger of ionising radiation to a higher extent are relocated to other areas.

Investigation level

A pre-defined value of a quantity used for dosimetric or radiation protection purposes, above which an investigation is required.

Reference group of the population

A group of persons whose exposure originating from a given source is of acceptably even distribution and represent the individuals who are most exposed to that radiation.

Committed effective dose [E(τ ττ τ)]

The sum of the products of the committed equivalent dose [$H_T(\tau)$] originating from the intake of radionuclides in tissue or organ T and the tissue weighting factor w_T :

$$\boldsymbol{E(\tau) = \sum T w_T H_T(\tau)}$$

where τ the integration time of the committed effective dose is given in years. The unit of the committed effective dose is Jkg^{-1}, termed the Sievert (Sv).

Committed equivalent dose [$H_T(\tau)$]

The time integral of the equivalent dose rate originating from the intake of radionuclides in tissue or organ T over the time period of τ:

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

where t_0 is the time of intake, $H_T(t)$ is the equivalent dose rate in organ or tissue T at time t and τ is the time elapsed after an intake of radioactive substances, given in years. When τ is not specified it will be 50 years for adults and to age 70 years for intakes by children. (For unit see committed effective dose.)

Committed absorbed dose [D(τ)]

The quantity D(t) is defined by the following expression:

$$\boldsymbol{D(\tau) = \int_{t_0}^{t_0+\tau} D(t)dt}$$

where t_0 is the time of intake, D(t) is the absorbed dose rate at time t and τ is the time elapsed after the intake of radioactive substances. When is not specified it will be taken to be 50 years for adults and to age 70 years for intakes by children. The unit of the committed absorbed dose is gray (Gy).

Artificial (radiation) source

A radiation source other than those naturally occurring.

Worker employed on workplaces of potential occupational exposure

Any person who works, whether full time, part time or temporarily, for an employer and who has recognised rights and duties in relation to occupational

radiation protection. Self- employed person is regarded as having the duties of both an employer and a worker.

High activity sealed source

Such a sealed source, which activity as declared by the producer or distributor equals to or exceeds the activity values specified in Annex 14.

Open source

A radiation source to which the definition of a sealed source is not valid.

Optimisation

Selection of the best options and solutions based on the comparison of different radiation

protection measures and technical solutions, taking also the costs into consideration.

Transformation of radioactive substances

Processing or elaboration of a radioactive material resulting in the changing of the chemical and/or physical form of the given radioactive substance, without the increase of the activity and/or activity concentration of the substance.

Production of radioactive substances

Any activity aimed at the production of a new radiation source by activation or by extraction of natural radionuclides.

Radioactive contamination

Contamination of any material, surface or person by radioactive substances. The contamination of the human body includes both the external contamination of the skin and the internal contamination of the organism, irrespective of the specific pathway of the radionuclide intake.

Radionuclide

An atom characterised by a well-defined number of neutrons and protons in its nucleus, whereby the nucleus is in a non-stable energy state.

Radionuclide intake

The activity of the radionuclides entering the human body from its external environment.

Partial supervision

Checking the existence of the personal and material conditions required by the license for a given practice, as well as the compliance with the regulations.

Sievert (Sv)

The special unit of the equivalent dose and the effective dose:

$$1\ Sv = 1\ J\ kg^{-1}$$

Radiation source

Radioactive substance and equipment or facility capable of emitting ionising radiation.

Employee subjected to occupational exposure

Any person, either self-employed or working for an employer, who is exposed to ionising radiation originating from a practice falling within the scope of the application of the atomic energy, which may result in an exposure exceeding any of the dose limits defined for the members of the public.

Optimisation of the radiation protection

A procedure by which the design and operation of the radiation source, as well as all activities associated with it makes certain that the exposure - while keeping it below the dose limits - is as low as reasonably achievable, taking also the economic and social factors into consideration.

Radiation weighting factor

Multipliers (wR) of the absorbed dose used for radiation protection purposes to account for the relative effectiveness of different types of radiation to inducing health effects in different tissues and organs. The most frequently used values of the radiation-weighting factor are given at the definition of the “Equivalent dose”.

Radiological emergency

The existence of certain conditions under which urgent intervention actions are required either partly or in its totality, for the protection of the employees, members of the public or the whole population.

Normal exposure

An exposure which is expected to be received under normal operating conditions of an installation or a source, including possible minor mishaps that can be kept under control.

Personal dose equivalent (Hp[d])

The dose equivalent in soft tissue at an appropriate depth d below a specified point of the body surface. The ICRU recommends d=10 mm for strongly penetrating radiation and d=0.07 mm for weakly penetrating radiation. The unit of the quantity is Jkg^{-1}, termed the Sievert (Sv).

Decontamination

The removal or reduction of contamination present in certain substances, in the human body or on its surface, as well as in the environment.

Stochastic effects of radiation

Radiation effects, generally occurring without a threshold level of dose, whose probability are proportional to the dose and whose severity are independent of the dose.

Full-scale supervision

Checking the existence of the personal and material conditions required by the license for a given practice, as well as the compliance with the regulations, completed with specific radiation protection measurements, for the purpose of issuing a license or performing activities requiring the permission of the competent regulatory authority.

Natural sources of radiation

Naturally occurring sources of ionising radiation, including terrestrial sources (primordial radionuclides) and cosmic radiation.

Tissue weighting factors

Multipliers (w_T) of the equivalent dose to an organ or tissue used for radiation protection purposes to account for the different sensitivity of different organs and tissues to the induction of stochastic effects of radiation. The values of the tissue-weighting factor are given at the definition of the “Effective dose”.

Final disposal

Final placement of radioactive waste in a storage facility or any given place, without the intention of retrieval.

Emergency exposure

An exposure, exceeding any of the dose limits, received by volunteers during any of the following intervention actions:

a) performing urgent action to provide help to people in danger;

b) preventing or reducing public exposure of population groups;

c) participation in the protection of facilities and goods.

Reference level

Action, intervention, investigation level, as well as the registration level of the individual exposure. Reference level can be pre-defined for any quantity used in the practice of radiation protection.

Sealed source

A radiation source, the structure of which - under normal conditions of use - prevents the release of the contained radioactive substances into the environment.

Annex 2 to the Ministerial Decree 16/2000 (VI. 8.) EüM

I. Dose limits, action levels for radon concentrations in workplaces

1. Dose limits applicable for the employees

1.1 Any radiation exposure to the employee that may occur during working in situations within the sphere of responsibility of the employer shall be considered occupational exposure. Occupational exposure does not include doses received from medical diagnostic examinations and therapeutical treatments, as well as from natural sources not falling under the power of this Decree or are exempt from the regulation.

1.2 No persons under the age of 18 years shall be subjected to occupational exposure.

1.3 The sum of the external and internal dose received from artificial and/or enhanced natural sources by any employee during the occupation shall not exceed the effective dose of 100 mSv dose limit per 5 consecutive years. In any single calendar year the effective dose shall not exceed 50 mSv. Irrespective of the dose limits given above for the effective dose the annual equivalent dose limit for the lens of the eye is 150 mSv. For the skin - averaged over any 1 cm^2 area of its surface - and for the extremities the corresponding annual equivalent dose limit is 500 mSv.

1.4 The prohibition of the employment of pregnant women, nursing mothers and women providing mother milk is regulated in separate legal regulations.

1.5 If under special circumstances of operating or monitoring facilities of radiation hazard - excluding, however, the intervention in emergency - exceeding the dose limits given in Paragraph 1.3 cannot be avoided, the Office of CMOS, on a case-to-case basis, may authorise special exposure for volunteers, nominated by the licensee. The special exposure shall not exceed an annual effective dose of 50 mSv. Special exposure may be allowed seasonally and only under the following conditions:

1.5.1 special exposure may be allowed only for persons classified A in Paragraph 1.2 of Subsection IV of this Annex;

1.5.2 special exposure permit may be valid for up to max. 5 years and cannot be repeated for the same person;

1.5.3 the employer or the licensee must justify the special exposure in advance, it must be communicated to the employee and it must

be reported to the Radiation Health De-centre and the occupational health service, as well as to the NRIRR;

1.5.4 the employer is obliged to provide all the protective measures required by the operations associated with special exposure, moreover it is the responsibility of the employer to let the affected employee know about the extent of the risk; separate dosimeter may be used for the measurement of the special exposure;

1.5.5 special exposure shall not be authorised for women of reproductive capacity, for students, trainees and for apprentices;

1.5.6 receiving special exposure shall not be considered as a reason to exclude a person from the original work position and/or to transfer him/her to another position without his approval.

1.6 In case of emergency the dose received by a person taking part in the intervention shall not exceed an effective dose of 50 mSv. Exception is made with the person who carries out operation to prevent major exposure of the public or to save lives. In this case all possible measures shall be made to keep the exposure under the effective dose of 100 mSv, or under 250 mSv in life saving operation.

1.6.1 The employer is obliged to provide the protective means and measures associated with the emergency interventions.

1.6.2 Women of reproductive capacity, students, trainees and apprentices shall not be involved in the emergency interventions.

2. Radon exposure of the employees

2.1 If the employee is unavoidably subjected to exposure from radon during his/her work the dose limits defined in Paragraph 1.3 shall be applied by taking the contribution of the radon into account.

2.2 Under conditions differing from those defined in Paragraph 2.1 the occupational exposure from natural sources shall be considered as chronic exposure under normal conditions for which the requirements of the long-term interventions apply. The corresponding action level for such cases is 1000 Bqm^{-3} radon concentration in air, in annual average.

3. Students, apprentices

3.1 For the limitation of the total external and internal exposure of students and apprentices over their age of 18 years the dose limits defined in Paragraph 1.3 shall be applied. For students, trainees and apprentices of 16 to 18 years the limit of the total effective dose received

in the consequence of their training is 6 mSv in a year. Irrespective of the dose limits given for the effective dose the annual equivalent dose limit for the lens of the eye is 50 mSv, for the skin - averaged over any 1 cm^2 area of its surface - and for the extremities the corresponding annual equivalent dose limit is 150 mSv.

3.2 For the limitation of the exposure of students, trainees and apprentices not listed in 3.1 the annual effective or equivalent dose limits given for the members of the public shall be applied.

4. Members of the public

4.1 The public exposure is the exposure of the members of the public originating from artificial sources, excluding the occupational and medical exposures.

4.2 The total external and internal public exposure originating from artificial sources - except for the doses received from medical diagnostic examinations and therapeutical treatment, by

voluntarily supporting and comforting patients or during voluntary participation in medical research - shall not exceed the annual effective dose limit of 1 mSv.

Under special conditions, for a single year, the Office of CMOS may authorise an effective dose limit higher than this, providing that the average individual exposure during the 5 consecutive years following the given year does not exceed the effective dose of 1 mSv.

Irrespective of the annual dose limits given above for the effective (whole body) dose the annual equivalent dose limit for the lens of the eye is 15 mSv, for the skin - averaged over any 1 cm^2 area of its surface - the corresponding annual equivalent dose limit is 50 mSv.

II. Dose constraint

In order to make sure that the occupational or public exposure originating from a given practice or from a controlled source does not exceed considerably the reasonably achievable lowest level a source related constraint should be applied. Its values - below the dose limits - (the range in case of the occupational exposure of the employees and the upper limit of the annual effective dose in case of the public exposure of a group of the population), related to the given source, field of application and group of population shall be determined by the Office of CMOS, based on the consideration of the radiation hygienic situation.

III. Emergency intervention and action levels

1. During the application of this Decree, in emergency (situations resulting from incidents or accidents or involving lasting conditions of exposure to ionising radiation) the measures to be taken to prevent or to mitigate the public exposure shall be adjusted to the intervention levels (dose) or to the action levels (activity concentration). During the decision about the extent and implementation of the protective measures the basic radiation protection principle of the justification shall be considered: the reduction of the detrimental health effects by the dose averted with an intervention or protective action must justify the harms, damages and costs associated with the measures taken. The mode, extent and timing of the intervention must be optimised.

2. The intervention levels applicable for emergency exposure are given in Annex 1; the action levels for the activity concentrations in foodstuffs and in drinking water are given in separate legal regulations.

3. The measures to be taken for the management and mitigation of an accident occurring on a site under the responsibility of the user of the atomic energy - providing that these measures exceed the capabilities of the user of the atomic energy - are contained in the workplace emergency plans (hereinafter Workplace EP). Measures applicable for the incidents or emergency situation occurring during the transportation of nuclear and radioactive materials or radioactive wastes are given in emergency plans (EP) defined in separate legal regulations. The emergency plans must be revised periodically (periods being regulated by the Workplace RPR or by separate legal regulations) and the emergency operations shall be exercised by the intervening personnel.

4. For the protection of the life and health of the public it is justified to take actions

appropriate to the radiation situation if the projected absorbed whole body or bone marrow dose, expectable within a short period of time (less than 2 days), exceeds 1 Gy, or the absorbed dose to the lens of the eye exceeds 2 Gy, or the dose to the skin or to the gonads exceeds 3 Gy, or the dose to the thyroid exceeds 5 Gy, or the dose to the lung exceeds 6 Gy.

5. At dose levels lower than those listed in Paragraph 4 intervention is justified only if the dose avoided by the given intervention (averted dose) and the resulting decrease of the radiation related detrimental health effects is great enough to compensate the harms and costs of the intervention. In case of the intervention levels (averted dose) given in Annex 1 the interventions are generally justified and optimised. When applying them it is expedient to consider

the severity of the accident or emergency, the possibilities of the implementation, the prevailing meteorological conditions, the traffic conditions, as well as the expectable consequences.

IV. Radiation exposure monitoring

1. Occupational exposure

1.1 The user of the atomic energy is responsible for the monitoring of the occupational exposure relating to the source of the exposure, considering the conditions of the work and according to the regulations.

1.2 Workers employed in workplaces of potential exposure to ionising radiation shall be sorted into two classes. Class A employees are those, whose annual effective dose may exceed 6 mSv, or any of the respective organ doses may exceed 3/10 fraction of the dose limits given in 1.3 Paragraph of Subsection I. All other employees are sorted into Class B.

1.3 The licensee shall sort the employees into classes according to 1.2.

1.4 The monitoring of the external exposure of Class A employees by personal dosimetry is compulsory and must be done according to the procedures and provisions given in Appendix 2 of this Annex.

In case of the possibility or suspicion of incorporating open radioactive substances the affected employee shall be subjected to internal contamination monitoring. The obligation of the internal monitoring shall be determined by the Radiation Health De-centre. The way of record keeping and the mode and frequency of reporting is regulated by the Workplace RPR; the method and the results of the monitoring must be communicated to the National Personal Dosimetry Service (NRIRR).

1.5 At workplaces where, by their characteristics or placing, the presence of natural radiation sources on or around the site may lead to a significant increase of the exposure to the employees, the employer shall have the radon concentration in air and/or the rate of the ambient dose equivalent originating from external sources determined. Types of workplaces and practices especially affected by this provision are listed in Annex 2 of this Annex.

1.6 If it is justified by the level of the radiation, the Office of CMOS orders the regular monitoring of the individual exposure at workplaces with enhanced exposure due to natural sources and determines its method (Annex 2).

1.7 In facilities where exposure of beta and neutron radiation can be expected, the obligation for the regular monitoring of the affected employees concerning these types of exposure will be determined by the county institute.

1.8 Persons authorised for special exposure, intervening in emergency situation or exposed to chronic irradiation resulting from an emergency shall be subjected to personal dosimetric monitoring.

2. Public exposure

2.1 The public exposure shall be determined within a designated reference group of the population with a frequency defined by the Office of CMOS.

Appendix 1 of Annex 2

Intervention levels applicable in emergency exposure situations

1. The intervention level is expressed in avertable (effective or equivalent) dose. A protective action shall be implemented if the avertable dose exceeds the intervention level corresponding to the given intervention action.

2. The intervention levels expressed in avertable doses are to be considered average values over suitably chosen groups of the population.

3. The optimised generic intervention levels for urgent protective actions:

Protective action	**Intervention level** **Effective dose, E**	**Committed absorbed dose in the thyroid gland**
Sheltering	10 mSv, in a period of no more than 2 days	
Evacuation	50 mSv, in a period of no more than 1 week	
Iodine prophylaxis	-	100 mGy

4. The optimised generic intervention levels for the relocation of the population:

The type of relocation	**Intervention level for initiating relocation**	**Intervention level for terminating relocation**

	Effective dose, E	**Effective dose, E**
Temporary	30 mSv/month	10 mSv/month
Permanent	1 Sv/lifetime	

Appendix 2 of Annex 2

Regular monitoring and registering of the individual exposure

1. The regular, centralised official personal monitoring of the occupational exposure originating from external X-ray and gamma emitting sources shall be organised and performed by the NRIRR.

2. The laboratory performing the official monitoring shall be accredited.

3. The dosimeters necessary for the personal monitoring (hereinafter personal dosimeters) shall be acquired and provided to the employer by the NRIRR. The evaluation of the detectors once in every 1-6 months, depending on the potential individual exposures and on the measuring methods applied - shall be done in a number justified by the practice described in the report of the controlled workplace. After the employee, who is registered for regular personal monitoring, stops working or his/her potential occupational exposure monitoring ceases (either temporarily or permanently); the employer shall return the dosimeter badge to the NRIRR.

4. The employer, via the activity of its Radiation Protection Service, is responsible to make sure that the employees, who are subjected to regular official occupational dosimetric monitoring, receive the dosimeters and that they wear them during the full working time or the time of the practice. The employee performing the practice is obliged to wear the dosimeter. If the employee, in spite of respective notice, does not wear the dosimeter, or does not wear it according to its intended function, the employer shall prohibit the employee the practice.

5. During out-of-work time or after finishing the daily practice the dosimeters shall be stored on a place where they are not subjected to exposure to additional exposure, other than the natural exposure. During handling and wearing, the dosimeters shall not be damaged or shall not be accessed by unauthorised persons.

6. The Radiation Protection Service is obliged to maintain a registry of the dosimeters in which the data of the affected persons, the serial number of the issued dosimeter, the date of the issue or change and the date of the submission to the NRIRR are registered. Any change in the number or data of the people involved in the monitoring shall be communicated immediately to the NRIRR. For the purpose of maintaining and updating the central dosimetric registry the forms associated with the dosimeters shall be returned to the NRIRR after the expiry of the monitoring period.

7. After the end of the monitoring period - in case of accidental exposure or its suspicion after the accident, as well as immediately after the emergency exposure or special exposure - the Radiation Protection Service is obliged to collect the dosimeters and to return them, together with the dose records, to the NRIRR.

8. The NRIRR shall evaluate the submitted dosimeters. The quantity resulting from the evaluation is the personal dose equivalent [Hp(10)]. For the purpose of the evaluation of the exposure the effective dose given in the dose limitation system shall be considered equal to the personal dose equivalent.

9. The NRIRR communicates the result of the evaluation to the employer. In case of accidental exposure or its suspicion, as well as after emergency exposure or special exposure the evaluation shall be performed out of turn and the measures prescribed for such cases shall be taken.

10. If the reading of the dosimeter or the dose estimated from it substantiate the suspicion that the holder of the dosimeter received an irregular exposure or an unjustified effective dose reaching or exceeding 2 mSv but not exceeding the official investigation level of 6 mSv, the NRIRR notifies the licensee. In order to determine and record the actual personal exposure and, if needed, to improve the conditions of the radiation protection, the employer - via its Radiation Protection Service - shall take measures to investigate the case on the site and to determine the possible personal responsibilities. The result of the investigation shall be communicated to the NRIRR.

11. In case of persons exposed to beta and/or neutron radiation the personal dosimetric monitoring shall be the responsibility of the employer, in accordance with the approved Workplace RPR.

12. The laboratory performing the monitoring of the beta and neutron exposure shall be accredited.

13. The quantity determined by the measurement of the beta dose is the personal dose equivalent [Hp(0.07)]. For the purpose of the evaluation of the exposure the skin and lens equivalent dose given in the dose limitation system shall be considered equal to the personal dose equivalent.

14. The quantity determined by the measurement of the neutron dose is the personal dose equivalent [Hp(10)]. For the purpose of the evaluation of the exposure the effective dose given in the dose limitation system shall be considered equal to the personal dose equivalent.

15. In case of persons subjected to internal exposure the appropriate dosimetric surveillance shall be provided by the licensee, in accordance with the approved Workplace RPR.

16. The laboratory performing the monitoring of internal exposure shall be accredited.

17. The result of the internal exposure investigation shall be given in committed effective dose. The committed effective dose contributions of all the radionuclides inhaled or ingested shall be summarised.

18. For the purposes of the central registry defined in Paragraph 19 the results of the beta,

neutron and internal dosimetric investigations shall be communicated to the NRIRR with a frequency prescribed for the given workplace.

19. The Personal Dosimetry Service of the NRIRR maintains a central electronic database on employees in job position subject to radiation exposure, including the external workers. The Workplace Radiation Protection Service shall report any change in the data of employees subject to the effect of ionizing radiation, including the commence of employment, the change or destination of job position to the central register of the NRIRR within 15 working days. The information shall be provided in writing or electronically. The information shall include the personal data of the employee as follows: name, sex, nationality, birth name, mother name, birth place (country, settlement), birth date, social assurance number (passport number for non Hungarian foreign citizen employees).

The supervisory authority verifies the data provision obligation to the central register.

For employees working in position requiring regulatory personal dosimetry monitoring, the central register accumulate the external and internal doses.

The permitted special radiation exposures shall be recorded independently of the radiation exposures received under normal conditions.

The results of the official personal dosimetric monitoring shall be archived in the central dosimetric registry for 50 years after the termination of the work or the cessation of the monitoring of the employee.

20. The time period of the 5 year dose summation is the same for all monitored persons, starting first time on the 1st day of the year following the entry of this Decree into force.

21. The Radiation Protection Service of the workplace is obliged to archive the dosimetric results during and up to 50 years after the radiation work period of the employee. In case of the change of the employer the dosimetric records shall be archived by the legal successor. In case of starting a liquidation or final settlement procedure the records and certificates shall be handed in to the Radiation Health De-centre.

22. On the request of the affected employee the results of the personal dosimetric monitoring or the individual exposure assessments, based on the estimations derived from the measurements on the workplace shall be made available.

23. The employer shall acquire the approving statement of the employee to be subjected to occupational exposure monitoring that his/her personal dosimetric data be registered and handled by the NRIRR, under conditions regulated by separate legal regulations.

24. If a monthly increment of the registered dose of the employee exceeds the effective dose of 6 mSv or the total dose summarised for the given year exceeds the effective dose of 20 mSv, the NRIRR immediately notifies the Radiation Health De-centre. The informed Radiation Health De-centre performs an on site investigation, implements measures based on and immediately notifies the NRIRR about the results.

25. If, during the course of the year, the accumulated exposure of the employee exceeds 3/10 fraction of any of the permitted organ dose limits an official investigation detailed in Paragraph 23 shall be performed.

26. The exposure of the personnel shall be monitored even if the exposure originates solely from natural sources. Such type of working places, practices or occupational groups are as follows:

26.1. spas, cave therapy establishments, caves as tourist sights, underground mining facilities and other underground workplaces;

26.2. surface workplaces where the grinding, milling, processing, enrichment, transport of the rocks, minerals and other materials containing natural radioactive substances,

as well as the storage and packaging of their products may lead to enhanced exposure;

26.3. civil aviation aircraft crew serving on intercontinental flights or on flights of high altitude.

Annex 3 to the Ministerial Decree 16/2000 (VI. 8.) EüM

Requirements of the radiation protection qualification

1. Radiation protection qualification certificate for a device or equipment (hereinafter product), applied within the utilisation of the atomic energy, can be issued only if

a) the product complies with the corresponding standards or with the radiation protection provisions contained in other documentation, and complies with the requirements of the healthy and safe working conditions,

b) the product is shipped together with a user's guide or manual containing also the corresponding radiation protection instructions in Hungarian ,

c) the identifying technical details, the radiation protection structure and the safety functions of the product can be determined from the attached documentation,

d) cancelled.

2. The producer, distributor or user can initiate, at CMOS, the expert opinion substantiating the radiation protection qualification procedure of the product by filling up of the data sheet found in this Annex.

3. The product has to be qualified again if the structure or the material of the already qualified product has been modified, in a way that the radiation protection structure and/or the safety systems of the product have been affected. The product has to be re-qualified also when its recommended sphere of application has changed.

4. On the initiation of the Office of CMOS or on the request of the user the product may be re- tested to determine if the product manufactured and distributed in serial production still maintains the characteristic features of the tested and qualified prototype. The Office of CMOS may initiate the revision of the qualification of the affected product also when the provisions of the corresponding standards change.

5. The Declaration of Conformity (CE) of the producer shall be attached to the order for the NRIRR expert opinion as per Subsection (1) of Section 4, for medical products the certificate of the notified body that the producer implemented a full scope quality management system, the detailed technical specification of the equipment and the user manual of the equipment in Hungarian.

Data to be provided with the application for radiation protection qualification

1. Name and address of the applicant:

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2. Type, name, producer of the device, equipment:

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3. Type of the radiation source:

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4. The characteristic features and parameters of the radiation source (nominal tube parameters, max. loadable activity, etc.)

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5. Enclosures:

1. User's Manual (in Hungarian)

2. Technical specification

Annex 4 to the Ministerial Decree 16/2000 (VI. 8.) EüM

Radiation protection training and retraining

All workers employed in practices falling within the sphere of application of the atomic energy or in any other service relation must be trained and examined - depending on the risk associated with the practice - in following grade radiation protection

- training and
- retraining in each 5 years.

I. Training

1. Basic level radiation protection training shall be provided to those employed in positions associated with practices of occupational exposure but they do not work with a radiation source.

2. Extended radiation protection training shall be provided to those

a) working in the field of industrial, medical radiology applying ionising radiation - including the users of the open and sealed sources -, handling the source independently or supervising such practices,

b) working in the field of medical care where sources of ionising radiation are used from time to time.

3. Comprehensive radiation protection training shall be provided to those

a) employed in positions independently performing or managing practices associated with enhanced risk of occupational exposure, supervising such practices or control them from the point of view of radiation protection,

b) designing the radiation protection of workplaces of occupational exposure or deciding on the compliance of such plans from the point of view of radiation protection,

c) designing, managing therapeutic procedures involving ionising radiation on workplaces of medical care, or supervising such practices from the point of view of radiation protection,

d) performing the regulatory control of workplaces of occupational exposure,

e) providing expertise services in the field of radiation hygiene and radiation protection,

f) providing extended and comprehensive training and examination,

g) participating in nuclear emergency management with the authority for decisions on interventions, who are entitled to decide and order protective measures in case of emergency. 4. The training may be given by a person (hereinafter the trainer) who declared this activity to the health public administration organization according to a separate law.

5. The radiation protection training and re-training is liable to training fee. The fees associated with the training shall be borne by the licensee.

6. The examination shall be performed by the trainer, but the representative of the Office of CMOS shall always be present at the examination. The participation of the representative of the Office of CMOS is liable to fee. The fees associated with the examination shall be borne by the trainer.

7. The successful completion of the examination shall be certified by the certificate to be issued by the trainer. The certificate shall contain the grade of the training course, the general specification of the participants (e.g. public health, industry, and research), as well as the more specific field of activity (practice) as defined in the training program and the personal data of the participant. The certificate is not liable to fee, its costs are included in the fee associated with the examination.

II. Retraining

1. Basic level retraining in radiation protection shall be provided to those persons mentioned in Paragraph I.1 of this Annex.

2. Extended retraining in radiation protection shall be provided to those persons mentioned in Paragraph I.2.

3. Comprehensive retraining in radiation protection shall be provided to those persons mentioned in Paragraph I.3.

4. Concerning retraining the provisions of Paragraphs I.4-7. shall also apply.

III.

1. The training in radiation protection can be obtained in both the general (gradual) and the special training branches of the higher education institutions, in case that a licensed training of the level defined in Paragraph I.2. - with the full consideration of the provisions of Paragraph I.4. - is provided.

2. The examination shall be performed in accordance with the provisions given in Paragraphs I.6-7.

IV. The professional requirements of the training

Basic level

1. Basic knowledge in radiation physics min. 2 h

2. Basic knowledge in radiation protection min. 4 h

3. Consultation min. 2 h

Extended level

1. Introduction to radiation physics and dosimetry min. 4 h

2. Introduction to radiation biology min. 2 h

3. Radiation protection, dose limits, the system of regulatory control min. 12 h

4. Nuclear emergency management min. 2 h

5. Exercise min. 2 h

6. Consultation min. 4 h

Comprehensive

1. Introduction to radiation physics min. 6 h

2. Introduction to radiation biology min. 6 h

3. Radiation protection, dose limits, the system of regulatory control, radiation injuries, treatment of radiation injured persons min. 18 h

4. Nuclear emergency management min. 2 h

5. Exercise min. 4 h

6. Consultation min. 4 h

Annex 5 to the Ministerial Decree 16/2000 (VI. 8.) EüM

The basic requirements of occupational radiation protection

1. General requirements

1.1. The occupational radiation protection that is associated with the utilisation of the atomic energy shall be based on the knowledge of the radiation characteristics and of the extent of exposure, as well as on the implementation of the optimisation of radiation protection.

1.2. The conditions of the work on places of occupational exposure shall be determined so that the exposure of the workers and of the persons living (staying) in the vicinity shall not exceed the dose limits given in Annex 2, and that the radiation protection be optimised.

1.3. The licensee is obliged to take all possible measures in order to assure that the normal exposure of the employees and the risk of the potential exposure be as low as reasonably achievable, taking the economic factors into consideration.

1.4. The licensee shall provide all the material and personal conditions of the safe work prescribed in this Decree and in the license, as well as the necessary safety equipment, the protective means against the ionising radiation, the checking of the efficacy of the equipment and devices and the proper functioning, calibration and certification of the radiation measuring instruments.

1.5. The employee is obliged to comply with the provisions of the Workplace RPR and of the official licenses.

1.6. When carrying out a work of occupational exposure at least two employees shall be present simultaneously, at least one of them shall have proper professional and radiation protection qualification. This person shall be responsible for the compliance with the requirements of radiation protection. X-ray fluoroscopy and imaging may be performed by a single person with appropriate professional and radiation protection qualification.

1.7. Data of radioactive substances shall be recorded and maintained in a registry defined in separate legal regulations.

1.8. Radioactive substances shall not be circulated and traded without a certificate in Hungarian.

1.9. Radioactive substances that are currently out of use shall be stored in a locked place permitted for the storage. On the outer, accessible surface

of the storage facility the ambient dose equivalent shall not exceed 20 μSvh-1.

1.10. A place of increased danger of inflammation, explosion or corrosion must not be selected for the storage of radioactive substances or for the interim storage of radioactive wastes.

2. Classification of the working places

2.1. The licensee shall assign controlled and/or supervised area on the working place.

2.2. Controlled area is the working area,

a) where the annual individual occupational dose originating from the practice may exceed the effective dose of 1 mSv, or 1/10 fraction of the respective equivalent dose limits given for the lens, the skin and the extremities in Paragraph 1.3. of Annex 2, or

b) where the dispersion of the radioactive contamination or the risk of the potential exposure has to be limited.

2.3. On the controlled area the following special radiation protection measures and safety provisions shall be followed in order to limit the normal exposure and to reduce the risk of the potential exposure and/or to prevent the dispersion of the radioactive contamination:

2.3.1. the boundaries of the controlled area shall be marked unambiguously;

2.3.2. the access to the controlled area shall be controlled, the unauthorised access shall be prevented;

2.3.3. the entrance shall be equipped with a sign of the radiation danger and with the name of the working area or the working place;

2.3.4. the working area - with the exception of the established X-ray laboratories - shall be monitored with instrumentation suitable for the type of the radiation and the level of the occupational exposure;

2.3.5. on the controlled area only practices associated with the utilisation of the atomic energy can be performed, and only devices and substances needed for such practices can be stored, except for industrial radiography, in which case other types of material testing can also be performed, if justified;

2.3.6. on workplaces where there is a possibility that the annual external exposure exceeds the effective dose of 6 mSv, in addition to the personal dosimeters defined in Paragraph 3 of Annex 2 of the

Annex 2, immediately readable personal dosimeters or dose rate meters with sound and/or light warning/alarm signal shall be used. These devices shall be provided by the employer.

2.4. Supervised area is the working area, where the special radiation protection measures

and safety provisions defined in Paragraph 2.3. of this Annex are not to be followed under normal conditions. However, regular radiation monitoring is required on the supervised areas.

2.5. The system of the minimum requirements to be followed on supervised areas is contained in the Workplace RPR, considering the followings:

2.5.1. depending on the decision of the Radiation Protection Service the entrance of the supervised area shall be equipped with the warning sign and label of the radiation danger and with the name of working area and the working place;

2.5.2. depending on the decision of the Radiation Protection Service certified radiation monitoring instrument(s) suitable for the measurement of the type(s) of radiation occurring on the workplace should be installed;

2.5.3. depending on the decision of the Radiation Protection Service the scope of the practices to be performed, the type and amount of the devices and substances to be stored on the workplace can be limited;

2.5.4. where - within the supervised area - the dose equivalent rate can permanently exceed 20 μSvh-1 or the short term exposure can result in a dose equivalent higher than 50 μSv, but the re-classification of the area to controlled area is otherwise not justified, the area shall be bordered and marked with the sign of the radiation danger in a way that an unintended access to the area shall not be possible;

2.5.5. on places assigned for permanent stay within the supervised area the dose equivalent rate averaged over any 2 hours period shall not exceed 2.5 μSvh-1.

2.6. The assignment conditions of the controlled and supervised areas shall regularly be revised. In case of change the classification of the area and the provisions prescribed for the area shall be modified accordingly.

2.7. The licensee is responsible for having the working areas properly classified and for making sure that the system of requirements is fully complied with. Depending on the decision of the licensee radiation

protection expert(s) or board(s) of such experts shall be involved in the classification procedure and in the development of the system of requirements.

3. Basic requirements of works performed with instruments, equipment using sealed radioactive source or X-ray tube

3.1. A condition for the use of an instrument, equipment applying sealed radioactive source or X-ray tube (hereinafter equipment) is that its type description, reference manual contains user's instruction in Hungarian, corresponding to the prevailing radiation protection provisions.

3.2. Following general revision, modification the equipment can be put to use only after certified radiation protection measurements are performed. After any modification of an X-ray tube, resulting in the possible increase of the absorbed dose of the radiation beam or affecting the applied system of radiation protection shielding, the equipment shall be subjected to radiation protection measurement before it is put to regular use again. The radiation protection measurement shall be the responsibility of the one who has done the revision or modification, and the results shall be recorded in a measurement protocol and provided to the licensee. If it is justified by what has been entered into the protocol the licensee shall establish new radiation protection provisions or a new licensing procedure has to be initiated for the practice.

3.3. The integrity and/or surface cleanness of a sealed source shall first be checked by the producer before the source is put to use, later the licensee has to have it done by an authorised person/firm, with a frequency and according to the way regulated by the Workplace RPR.

3.4. It is prohibited to endanger the integrity of a radioactive source (e.g. by out-of specification mechanical impact, heating etc.).

3.5. The original copy of the certificate of the sealed source in Hungarian shall be archived by the licensee until the final disposal of the radiation source.

3.6. The equipment shall not be operated with expired period of use or radiative source having expired period of use shall not be used. The period of use shall be in harmony with the service time. If the producer has not determined the service time, then the first service time is determined by the Radiation Health De-centre based on the expert opinion of the NRIRR.

The first period of use determined by the Radiation Health De-centre shall not be longer than 15 years. The period of use can be extended based on

tightness test not older than a year and the expert opinion of the NRIRR with five years.

The sealed radioactive sources of installed equipment performing measurements in industrial processes shall have 25 years extended period of use at most; radioactive sources having half-life longer than 30 years can be used for 30 years as maximum.

In special situations and based on safety analysis, the NRIRR may suggest uniqu period of use.

3.6. It is forbidden to operate equipment using outdated radiation source. The time of use shall be adjusted to the time of service. If the producer does not provide the time of service, the time of use shall be determined by the Radiation Health De-centre, based on expert's opinion. The time of use determined in this way shall not be more than 15 years. The time of use can be extended max. two times, not exceeding 10 years in total, and it shall be based on the expert's opinion of the NRIRR.

3.7. After the irradiation the source shall be placed back to its permanent storage case. The condition of safe storage shall be confirmed by the operator with radiation measurements.

3.8. The licensee is responsible for the transportation of the sealed source, after its withdrawal from use, to the final storage facility. The transfer shall be reported to the Radiation Health De-centre and to the central registry of radioactive substances.

3.9. Portable equipment containing radioactive substances, when it is out of use, shall be kept locked in an officially permitted storage facility. With the exemption of portable radioisotope instruments categorised as III A according to the Appendix of Annex 7, the portable radioisotope equipment shall only be stored in licensed isotope storage.

3.10. The loss or disappearance of a sealed source shall immediately be reported to the Radiation Health De-centre, which shall notify the National Radiation Hygiene Preparedness Service and the National Police Headquarters.

4. Basic requirements of works performed with open radioactive sources

4.1. In case of regular work with open radioactive sources, radioactive tracer investigations and agricultural experiments, the preparatory work associated with radioactive material shall be carried exclusively in isotope laboratories.

4.2. The design and equipment of the isotope laboratory shall provide all the means required for the protection against external and internal exposure.

4.3. The requirements concerning the design and equipment are basically dependent on the kind and activity of the radionuclide used and on the type of the application or practice.

4.4. The application of open radioactive sources outside the premises of the isotope laboratory shall be planned in advance and have it authorised for each type of investigation. The repeated investigation shall be reported to the Radiation Health De-centre.

4.5. When establishing an isotope laboratory the working area where the operation with radionuclides will be carried out shall be separated from the working areas used for other types of activity.

4.6. When furnishing a working place where open radioactive sources will be used the selection of the furniture, equipment, floor and walls shall take into account the requirements of decontamination.

4.7. Practices resulting in pulverisation, evaporation of radioactive substances shall be performed in exhaust box or dry chamber.

4.8. The licensee is responsible to make sure that no radioactive material is released from the isotope laboratory without control.

4.9. The radioactive waste accumulating in the isotope laboratory shall be classified and collected separately, and it shall be stored until the decay of the waste or until it is transported away.

4.10. The Radiation Protection Service shall define in the Workplace RPR the rules of the radiation protection associated with a practice applying open radiation sources, based on the followings:

4.10.1. The working area within the area of the isotope laboratory, where - as an inevitable consequence of the practice - the ambient dose equivalent rate temporarily exceeds 20 μSvh-1, shall be marked with a warning sign.

4.10.2. In the laboratory single-use tools shall be used, if it does not increase the amount of generated waste in an unjustified extent.

4.10.3. All working places of potential occupational exposure shall be equipped with working tools, personal protection means, decontamination materials and radiation measuring instruments (accompanied with user's instructions in Hungarian), which are appropriate for the type and activity of the radionuclides used, for

the work to be performed and for the purposes of radiation protection.

4.10.4. In isotope laboratories, where the risk of the internal contamination is high, the personal monitoring of the employees shall be completed with internal contamination assessment. The necessity and methodology of the assessment shall be determined by the Workplace RPR.

4.10.5. The employee shall immediately report the inhalation or ingestion of radioactive substances, or the suspicion that it may have happened, to the radiation protection officer and to the head of the working place.

4.10.6. The personal protection equipment shall be worn in the way it is regulated by the Workplace RPR.

4.10.7. In the controlled area activity other than the permitted practice with radioactive substances shall not be performed (e.g. eating, using cosmetic preparations), objects not associated with the practice shall not be imported or stored.

4.10.8. The registry of the radioactive substances or preparations shall be made so that all operations associated with these substances, where and how the totality or parts of the substances are stored, be traceable. The deficiency shall be reported to the Radiation Health De-centre, in accordance with regulations given in separate legal regulations.

4.10.9. The laboratory is obliged to store the radioactive waste with half-life shorter than 65 days in the interim waste storage, as long as it is classified as a radioactive waste.

4.10.10. The character of the waste, the type of the radionuclide, the estimated activity and the date of the disposal shall be marked on the substances deposited in the interim waste storage.

4.10.11. In laboratories using open radioactive substances decontamination set shall be kept ready for use. It shall be provided by the licensee, taking into consideration the working areas of the laboratories, the number of the employees, the type and activity of the radioactive substances used.

4.10.12. The decontamination set shall be stored on an easily accessible, properly labelled places, close to the working area. The employees shall be trained in its use. The set may be used only for the decontamination of the radioactive contamination.

4.10.13. In case of the contamination of the floor, walls and equipment of the working place the immediate decontamination shall be the task of the employees working there, under the direction of the radiation protection officer.

4.10.14. If the contamination is discovered after the termination of the practice the decontamination and the initiation of the inactive status declaration procedure, as a proof of the effectiveness of the decontamination, shall be the responsibility of the owner of the area.

4.10.15. The management of the emergency situation resulting as a consequence of an accident, as well as the implementation of the decontamination shall be directed by an appropriate expert having the skill, experience and radiation protection qualification defined in Annex 2.

Annex 6 to the Ministerial Decree 16/2000 (VI. 8.) EüM

Workplace Radiation Protection Regulations (Workplace RPR)

The Workplace RPR contains:

1. the description of the organisation and the tasks of the Radiation Protection Service, taking Annex 8 into consideration;

2. the requirements, frequency and methodology of the external and internal exposure monitoring of the employees;

3. the radiation protection related tasks of the leaders of the facility;

4. the rights and duties of the employees working on workplaces of occupational exposure;

5. the description of the working areas and working positions of radiation danger, the radiation protection classification of the employees (Class A or B), the professional and radiation protection qualification required for the given positions, taking Annex 4 into consideration;

6. the technological description of the practice(s) of occupational exposure;

7. the system of requirements applicable for the controlled or supervised area;

8. the order of the integrity testing of the sealed sources;

9. the order of the storage and management the radiation sources;

10. the order of the surface contamination monitoring, radioactive waste management and the record keeping (registry) associated with them;

11. the provisions on the safety systems, personal protection means, radiation measuring instruments, as well as on handling, wearing, maintaining and certifying personal dosimeters;

12. the order of record keeping and the archiving of certifications, the duties of reporting to the authorities;

13. all the knowledge required for the safe implementation of the work at the given workplace;

14. the workplace emergency plan (Workplace EP), which contains the order of the management, handling possibilities and duties - including the local medical treatment of the radiation injured persons - for the case of a potentially occurring event, as well as the definition of the frequency of the

revision and of the exercising of the Workplace EP by the personnel involved in its implementation;

15. the definition of the time period after which the Workplace RPR is to be revised;

16. in case of a facility composed of more organisational units the workplace radiation protection regulations of the individual organisational units Annex the Workplace RPR.

17. In case of nuclear installations the Workplace RPR shall contain all what is described in Paragraphs 5, 6, 13, 14 and 16 of this Annex, or proper reference shall be made to separate documents approved by the authority competent in radiation protection issues.

Annex 7 to the Ministerial Decree 16/2000 (VI. 8.) EüM

Supervisory activity of the licensing authorities

1. cancelled

2. The Office of CMOS and the Radiation Health De-centres decide on the frequency of the full-scale supervision, taking the level of potential danger of the facility and/or practice into account:

The frequency of the supervision of special facilities is 1 year,

category I: frequency of the supervision is 1 year,

category II: frequency of the supervision is 3 years,

category III (A and B): frequency of the supervision is 5 years.

3. The categorisation of the facilities and practices are given in the Annex of this Annex.

4. The tasks of the Radiation Health De-centres in connection with their supervising function:

a) register the facilities and practices within their territorial competence and perform full- scale supervision with a frequency according to Paragraph 2;

b) in case of those facilities and practices where the frequency of the full-scale supervision is more than 2 years, perform mid-term partial supervision in their own county.

5. cancelled

Appendix to Annex 7

Classification of working places and practices within the sphere of application of the atomic energy for the purpose of determining the frequency of supervision

A) Equipment and/or working places

1. Medical and veterinary X-ray workplaces

    1.1. X-ray therapy I.

    1.2. X-ray diagnostics II.

    1.3. Dental X-ray III B.

1.4. Bone densimetry

a) forearm investigation (incl. radionuclides) III A.

b) whole body investigation II.

2. Medical therapy (sealed sources) workplaces

2.1. Teletherapy I.

2.2. Brachytherapy (afterloading) I.

2.3. Brachytherapy (stitching) II.

3. Accelerator workplaces

3.1. Medical therapy I.

3.2. Industrial, agricultural technology I.

3.3. Research, education I.

4. Industrial radiography workplaces

4.1. Coarse structure industrial X-ray II.

4.2. Laboratory gamma radiography II.

4.3. In situ gamma radiography I.

4.4. Parcel investigation III A.

5. Industrial and agricultural irradiation facilities (above 37 TBq)

5.1. Dry storage, panorama type I.

5.2. Water tank storage, panorama type I.

5.3. Dry storage, self-shielding (laboratory) I.

5.4. Panorama type, both storage and irradiation in water I.

6. Industrial measuring and process controlling equipment using sealed sources

6.1. Level switch, level meter, range signaller III A.

6.2. Thickness meter III A.

6.3. Surface mass meter II.

6.4. Densimeter III A.

6.5. Humidity meter III A.

6.6. Hand-held field measuring instrument (probe) II.

6.7. Hand-held workplace measuring instrument III A.

7. Geophysical measurement (carotage) II.

8. Material and fine structure research workplaces

8.1. X-ray material and fine structure measuring device III A.

8.2. Neutron-ray material composition analyser II.

8.3. Isotopic material composition analyser III A.

8.4. Gas chromatography III A.

8.5. Other nuclear measuring device II.

9. Medical and low activity level isotope laboratory

9.1. In vitro isotope diagnostics, low activity level research and training laboratory II.

9.2. In vivo isotope diagnostics I.

9.3. Isotope therapy I.

10. Industrial isotope laboratories

10.1. Level C isotope laboratory II.

10.2. Level B isotope laboratory I.

11. Other workplaces using radiation sources

11.1. Electron- or ion-ray equipment III A.

11.2. Static charge removal (discharging) II.

11.3. Calibration source III A.

11.4. Smoke detector III A.

12. Special facilities

12.1. Nuclear power plant

12.2. Experimental and training reactor

12.3. Uranium mine

12.4. Radioactive waste storage facility

12.5. Level A isotope laboratory

12.6. Spent fuel storage facility

B) Practices

1. Production, manufacturing

1.1. Sealed radiation source I.

1.2. Equipment, instrument, device containing sealed radiation source II.

1.3. X-ray machine II.

2. Storage facility for radioactive substances (with storage license only) II.

3. Miscellaneous activities (assembling, maintenance, service, certification-calibration)

3.1. X-ray machine servicing II.

3.2. Smoke detector mounting II.

3.3. Instrument certification (calibration) II.

3.4. In situ maintenance and servicing of equipment containing sealed sources, including integrity testing II.

4. Application of open radioactive substances outside the isotope laboratory II.

5. Packaging radioactive substances for trading purposes II.

6. Transportation of radioactive substances II.

7. Conditioning radioactive wastes at their place of origin and transportation for disposal I.

Annex 8 to the Ministerial Decree 16/2000 (VI. 8.) EüM

Tasks of the Radiation Protection Service

1. Registering and record keeping the permissions and licenses issued for the facility in accordance with this Decree, renewal or modification of these licenses, if needed, and the initiation of the withdrawal of the licenses when the given practices come to an end.

2. In case of the employees working in workplaces of occupational exposure:

    2.1. organisation of their training and registration of their participation in the training courses;

    2.2. organisation and registration of the medical investigations for work aptitude;

    2.3. organisation and registration of the personal dosimetry monitoring.

3. Approval of the application for the acquisition of radioactive substances, taking over these substances, controlling their use, organisation and registration of their removal. In case of supervision the registry shall be presented to the radiation hygienic authority.

4. Controlling the transportation of radioactive material within the workplace (site).

5. Developing radiation protection provisions for any newly introduced procedure, method of potential occupational exposure, approval of this new procedure from the radiation protection point of view.

6. Provision for continuous maintenance of the equipment and devices used for radiation protection purposes, and care for their regular certification and calibration, in accordance with the regulations given in separate legal regulations.

7. Monitoring of the possible radioactive contamination of the working area (with the frequency defined in the Workplace RPR) and the management of the decontamination.

8. Reporting the observed radiation protection deficiency or negligence - completed with a proposal for the solution - to the leader of the organisational unit or of the facility, if the required intervention extends beyond the authority of the Radiation Protection Service.

9. Performing the actions defined in the Workplace EP in emergency case.

10. Supervising the collection, storage and handling of radioactive wastes, monitoring and registering the radioactivity of the solid wastes removed, as well as the liquid and gaseous effluents released from the working places and organisational units.

11. Registering and archiving measurement data, measuring protocols after revision and maintenance works affecting the radiation protection features.

12. Monitoring the environment of the facility from the radiation protection point of view.

13. Participating in the industrial safety inspection and in the authority supervision of the workplaces of occupational exposure.

14. Keeping contact with the authorities, data provision to them.

15. Fulfilling the reporting obligations prescribed in this Decree and in other legal regulations.

16. Fulfilling all the radiation protection duties and tasks which are ordered by law, by the Workplace RPR or by the written instruction of the leader of the facility.

Annex 9 to the Ministerial Decree 16/2000 (VI. 8.) EüM

Radiation protection requirements applicable for public road transportation vehicles

1. In case of the transportation of non-exempted package items the transport vehicle shall be equipped with special objects (like rope supports, ropes, signs and labels of radiation danger etc.) to be used to encircle sites where the dose rate exceeds 20 μSv/h in order to prevent unintended access, in the following cases:

- immobility of the vehicle due to an accident or any other reason of technical origin, expected to last longer than 1 hour, and
- displacement or damage of the load.

2. On each vehicle transporting non-exempted package items certified radiation monitoring devices shall be operated (kept in stand-by state) which is capable of measuring the dose rate in the vicinity of the package items.

3. Unpacked, surface contaminated objects and liquids in industrial packaging can be transported only in vehicles where the internal walls of its load compartment is covered with material which is easy to decontaminate.

4. For the transportation of liquid radioactive substances in industrial packaging the vehicles shall be equipped with hygroscopic material, in a quantity which is enough to sponge up the total volume of the transported liquid, with rubber gloves and with plastic sacks (bags) in a number and volume enough to store the "sponge" material, as well as with proper appliances to seal these sacks.

5. Liquid radioactive substances in industrial packaging can be transported exclusively in vehicles where the load compartment and the passenger compartment are separated or they constitute two separate units.

Annex 10 to the Ministerial Decree 16/2000 (VI. 8.) EüM

Data provision for the license application

1. Name and address of the applicant.

2. Name and address of the undertaking for vehicle.

3. Name, position, professional qualification, radiation protection qualification of the radiation protection officer and his/her deputy.

4. Name and address of the sites and/or organisational units of the applicant (where the practice is to be carried out).

5. List of the practice(s) to be licensed:

- establishment/operation/reconstruction of a facility;
- storage/use/transformation of radioactive substances;
- production/operation - maintenance-/transformation, mending of an equipment or device;
- termination of a facility/practice.

6. The following details of the facility/practice to be licensed:

6.1. description of the type, activity (maximum activity) and use of the radioactive substance or sealed source; description, name, producer, type, number of the radiation protection qualification of the equipment, device used for the practice;

6.2. name, producer, type, number of the radiation protection qualification of the ionising radiation generating equipment, device.

7. Specification of the jobs of potential occupational exposure, number of persons involved in the practice, their professional and radiation protection qualification.

8. List of the radiation protection measuring instruments and equipment to be applied.

9. Requested territorial validity of the applied license (according to Section 15).

10. In case of the application for the establishment of a facility information detailed in Paragraphs 1-8, as well as radiation protection and radiation safety plans shall be attached.

11. In case it is required by the provisions of the Governmental Decree on the Special Conditions of the Acquisition, Reporting of Possession and Operation of Materials, Equipment and Facilities falling within the Sphere of Application of the

Atomic Energy, a copy of the document certifying the change of the owner shall be attached to the application.

Annex 11 to the Ministerial Decree 16/2000 (VI. 8.) EüM

cancelled

Annex 12 to the Ministerial Decree 16/2000 (VI. 8.) EüM

List of the health institutions designated for the specialised treatment of the radiation injured or potentially injured persons

1. Central Military Hospital of the Hungarian Defence Forces, Budapest
2. Hospital of the Borsod-Abaúj-Zemplén County Community, Miskolc
3. Debrecen University, Medical and Health Science Centre, Debrecen
4. United 'Szent István' Hospital and 'Szent László' Hospital of the Capital City Community, , Budapest
5. National Oncology Institute, Budapest
6. 'Petz Aladár' County Hospital, Győr
7. Pécs Science University, Medical and Health Science Centre, Pécs
8. Szeged Science University, Albert Szent-Györgyi Medical and Medicine Science Centre, Szeged
9. 'Balassa János' Hospital of the Tolna County Community, Szekszárd

Annex 13 to the Ministerial Decree 16/2000 (VI. 8.) EüM

Cancelled

Annex 14 to the Ministerial Decree 16/2000 (VI. 8.) EüM

The threshold activities of high activity sealed sources are contained in the below table.

Element (Atomic number)	Radionuclide	Activity level (Bq)
Ferrum (26)	Fe-55	$4x10^{11}$
Cobalt (27)	Co-60	$4x10^{9}$
Selene (34)	Se-75	$3x10^{10}$
Krypton (36)	Kr-85	$1x10^{11}$
Strontium (38)	Sr-90[a]	3x109
Palladium (46)	Pd-103[a]	4x1011
Iodine (53)	I-125	$2x10^{11}$
Caesium (55)	Cs-137[a]	2x1010
Promethium (61)	Pm-147	$4x10^{11}$
Gadolinium (64)	Gd-153	$1x10^{11}$
Thulium (69)	Tm-170	$3x10^{10}$
Iridium (77)	Ir-192	$1x10^{10}$
Thallium(81)	Tl-204	$1x10^{11}$
Radium (88)	Ra-226[b]	2x109
Plutonium (94)	Pu-238[a]	1x1011
Americium (95)	Am-241[b]	1x1011
Californium (98)	Cf-252	$5x10^{8}$

[a] The activity level includes the daughter nuclide having half-life shorter than 10 days.

[b] Includes Beryllium neutron sources.