

RADIATION SAFETY DIRECTORATE

Pursuant to Article 26-e, paragraph 1, item 16 of the Law on Ionising Radiation Protection and Radiation Safety (Official Gazette of the Republic of Macedonia No. 48/02 and 135/07), the Director of the Radiation Safety Directorate hereby adopts a

RULEBOOK ON THE MANNER AND MEASUREMENT OF THE EXPOSURE OF THE GENERAL PUBLIC, KEEPING RECORDS AND SUBMITTING REPORTS ⁽¹⁾

Article 1

This Rulebook shall prescribe the manner and measurement of the exposure of the general public, keeping records and submitting reports.

Article 2

The measurement of the exposure of the general public to ionising radiation shall be performed by means of workplace and environmental monitoring.

Article 3

The measurement of the exposure of the general public to ionising radiation originating from activities with sources of ionising radiation by means of workplace monitoring shall be performed by measuring the ionising radiation dose rate and checking the level of radioactive contamination in accordance with the regulations on ionising radiation protection and radiation safety, in order to assess the level of exposure of the general public, taking into consideration all manners of exposure to ionising radiation.

Article 4

The measurement of the exposure of the general public to ionising radiation originating from work activities by means of environment monitoring shall be performed by measuring:

- 1) the gamma radiation dose rate,
- 2) the activity of individual radionuclides per unit mass of material, and
- 3) the concentration of activity in dust and aerosols, taking into consideration all manners of exposure to ionising radiation, internal or external: external exposure to gamma radiation, internal exposure by inhalation of dust, ingestion of contaminated food and potable water, ingestion of contaminated material and inhalation of radon derived from waste materials.

The measurements referred to in paragraph 1 of this Article shall be performed in the first six months of the commencement of the work activity and they shall be repeated each five years or immediately after the occurrence of a change in the circumstances of performing the work activity relevant to radiation protection.

Article 5

¹ This Rulebook is being aligned with Council Directive 96/29/Euratom of 13 May 1996 laying down basic standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation (CELEX 31996L0029)

The measurement of the exposure of the general public originating from permitted emissions of radioactive substances into the environment shall be performed by monitoring of the permitted emissions, in accordance with the Rulebook on the maximum permitted levels of emitting radioactive substances into the environment, the manner of performing monitoring, keeping records and submitting reports.

Article 6

The exposure of the general public to ionising radiation from radionuclides present in the environment shall be assessed on the basis of the environmental monitoring results (air, water, sediments, soil, atmospheric deposits, potable water, food, feed), established in Table 1, Table 2, Table 3, Table 4, Table 5, Table 6 and Table 7, given in the Appendix, which is a constituent part of this Rulebook.

The environmental monitoring referred to in paragraph 1 of this Article shall be adjusted in order to ensure faster and more precise assessment of the radiological risk and the measures to be taken in the following cases:

- a radiological emergency,
- situations in which there is an immediate danger of radioactive contamination in the environment, or
- situations in which the ambient dose equivalent rate is continuously higher than 250 nSv/h during 24 hours.

Article 7

The measurement of the exposure of the general public to radon in closed premises shall be performed by measuring the radon activity per unit volume of air in a closed room in order to establish compliance with the activity levels determined in the Rulebook on the levels of and conditions for exposure under special circumstances and in emergencies.

Article 8

The measurement of the exposure of the general public to ionising radiation originating from building materials shall be performed by measuring the activity concentration of individual radionuclides in the building material, in order to determine the compliance with the activity level established in the Rulebook on the maximum permitted levels of radionuclides in metals, building materials, manures, ashes from power stations and waste materials from mines and smelteries.

Article 9

In order to decrease potential exposure of the general public to abandoned sources of ionising radiation, the dose rate of all objects/sites where there is a high probability of the appearance of a dangerous uncontrolled source shall be measured, in accordance with the Rulebook on the categorisation of radiological and nuclear threats, as well as of introduction of waste materials into the territory of the Republic of Macedonia.

Article 10

Records shall be kept of the results obtained from measuring the exposure of the general public.

On the basis of the results in the records referred to in paragraph 1 of this Article, a report shall be drawn up and it shall be submitted to the Radiation Safety Directorate.

Article 11

When the report referred to in Article 10 paragraph 2 of this Rulebook concerns workplace monitoring, it shall contain the information established in the Rulebook on the manner and measurement of the exposure of occupationally exposed persons, keeping records and submitting reports, as well as the estimated exposure dose per individual.

Article 12

When the report referred to in Article 10 paragraph 2 of this Rulebook concerns environmental monitoring, measurement of the exposure to radon and ionising radiation originating from building materials, it shall contain the following information:

1. the name and main office of the authorised expert technical service performing environmental monitoring;
2. the date of taking samples, i.e. of performing measurements;
3. the sample and the sampling site, frequency and manner;
4. the measuring site, if applicable;
5. the manner of examining the samples;
6. the results obtained and any errors therein;
7. the methodology of assessing the exposure dose of the general public;
8. the dose assessed, and
9. notes.

Article 13

On the day of entry into force of this Rulebook, the Rulebook on the sites, methods and deadlines for examining contamination with radioactive substances (Official Gazette of SFRY No. 40/86) shall cease to apply.

Article 14

This Rulebook shall enter into force on the day following that of its publication in the Official Gazette of the Republic of Macedonia.

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7 September 2010

Skopje

Director,

PhD Nuzi Shahin

APPENDIX

Environmental monitoring

Table 1. Air monitoring

Sample	Sampling site	Frequency of sampling	Manner of sampling	Manner of examination
Air	Skopje Bitola Gevgelija	Daily	Continuously for 24 hours by absorbing at least 500 m ³ of air per hour through filter paper with known efficiency, at a height of 1,5 m from the soil	Total alpha activity Total beta activity Gamma spectrometric measurements Measurement of ⁷ Be concentration Specific measurements of separated beta emitters (¹³⁷ Cs, ⁹⁰ Sr) Measurement of alpha emitters separated by radiochemical procedures (²¹⁰ Po, U, Ra, Th)

Table 2. Monitoring of the rate of the ambient dose equivalent of gamma radiation in air

Frequency	Measuring sites
Continuously for 24 hours during the day	Skopje Veles Negotino Gevgelija Strumica Berovo Kriva Palanka Debar Kichevo Krushevo Ohrid and Bitola

Table 3. Monitoring of surface water and sediments

Sample	Sampling site	Frequency of sampling	Manner of sampling	Manner of examination
Surface water	River Vardar (near Gevgelija) River Lepenec (near Skopje, where it flows into the river Vardar) Lake Ohrid (the village of Radozhda)	Once each day for one month	Amount of 1 litre at a depth of 0,5m below the surface and at a distance of 1m from the shore	Total alpha activity Total beta activity Gamma spectrometric measurement Specific measurement of ⁹⁰ Sr
Sediment	River Vardar (near Gevgelija) River Lepenec (near Skopje, where it flows into the river Vardar) and Lake Ohrid (the village of Radozhda)	Once every six months	At a depth of 0cm to 10cm and at a distance of 1m from the shore	Total alpha activity Total beta activity Gamma spectrometric measurement Specific measurement of ⁹⁰ Sr

Table 4. Soil monitoring

Samples	Sampling site	Frequency of sampling	Manner of sampling	Manner of examination
Soil	Skopje Shtip	Twice a year (in April and October)	At a distance of up to 5cm, 5-10cm and 10-15 cm, while cultivated soil samples – at a depth of up to 10cm, 10- 20cm and 20- 30 cm	Gamma spectrometric measurement Specific measurements of ⁹⁰ Sr and ¹³⁷ Cs

Table 5. Monitoring of atmospheric sediments

Samples	Sampling site	Frequency of sampling	Manner of sampling	Manner of examination
Atmospheric sediments ¹	Skopje	Daily	Continuously for 24 hours at a height of 1m above the ground	Total alpha activity Total beta activity
	Gevgelija Ohrid	Total monthly sample		Total alpha activity Total beta activity Gamma spectrometric measurement Specific measurement of ⁹⁰ Sr

¹ Precipitation during the day or the month should also be recorded when taking samples.

Table 6. Monitoring of potable water

Samples	Manner of supply	Supply capacity (number of population)	Frequency of sampling	Manner of examination
Potable water	Waterworks	Up to 100 000	Annually	Total alpha activity Total beta activity Gamma spectrometric measurement Specific measurement of ^{90}Sr
		100 000 – 350 000	Monthly	
		Above 350 000	Daily	Total alpha activity Total beta activity in the sum of ten daily samples Gamma spectrometric measurement in the sum of monthly samples Specific measurement of ^3H in the sum of six monthly samples
Samples	Manner of supply	Supply capacity (%)	Frequency of sampling	Manner of examination
Potable water	Tank	Over 20% of the population	Annually	Gamma spectrometric measurement Specific measurement of ^{90}Sr

Table 7. Food monitoring

Samples		Sampling site/region	Frequency of sampling	Manner of sampling	Manner of examination
Garden crops				At green markets, stores, wholesale stations and production centres where a representative part of the population is supplied	Total alpha activity Total beta activity Gamma spectrometric measurement Specific measurement of ⁹⁰ Sr
	Root vegetables	Skopje Bitola Berovo	Yearly (in September or October)		
	Fruiting vegetables (Solanaceae, Cucurbitaceae, Fabaceae)	Skopje Strumica Gevgelija-Valandovo Radovish Tetovo	Twice a year - April, May - October		
	Bulb vegetables	Skopje Gevgelija	Twice a year - April, May - October		
	Brassica vegetables	Skopje The valley of the river Vardar Strumica Tetovo	Twice a year - June - October		
	Cruciferous vegetables	Skopje The valley of the river Vardar Strumica	Twice a year - May - October		
	Mushrooms	Skopje Kochani	Twice a year - June - October		
	Spices	Skopje Gevgelija	Twice a year - June - October		

Crops					
	Cereals	Pelagonija Skopje	Twice a year - June - October		
	Industrial crops	Prilep Pelagonija	Twice a year - July - November		
	Forage crops	Pelagonija Ovche Pole	Twice a year - April - November		
Vine crops					
	Vines	Skopje Tikvesh Veles	Annually - September/October		
Fruits					
	Berries	Skopje Tetovo Ohrid	Annually - May/June		
	Stone fruit	Skopje The valley of the river Vardar Ohrid Bitola	Annually - May/June		
	Pomefruit	Skopje Resen Tetovo	Annually - September/October		
	Nuts	Skopje Tetovo	Annually - September/October		
Bread and flour		Pelagonija Skopje	Four times a year		
Milk and dairy products		Skopje Bitola	Monthly		
Meat products		Skopje Sveti Nikole Shtip	Twice a year		