

15 Annex - Energy

**91. DECISION ON SYSTEMATIC EXAMINATION OF THE
CONTEST OF RADIONUCLEIDES IN THE ENVIRONMENT**

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DECISION

ON SYSTEMATIC EXAMINATION OF THE CONTENTS OF RADIONUCLIDES IN THE ENVIRONMENT

(Official Gazette of the Federal Republic of Yugoslavia 45/97 and Official Gazette of Serbia and Montenegro 1/2003 – Constitutional Charter)

I BASIC PROVISIONS

Systematic examination of the contents of radionuclides in the environment shall be performed in the manner and under conditions laid down herein.

Examination of the level of external radiation and contents of radionuclides in the environment shall be performed by measurement of intensity of the absorbed dose of gamma radiation in the air and by measurement of the specific activity of radionuclides in samples taken from the environment.

Measurement of intensity of the absorbed dose of gamma radiation in the air shall be performed by a calibrated device that can continuously register daily variations in intensity of the absorbed dose of gamma radiation in the air (from 0.1 mGy/h to 15 mGy/h) with resolution at the level of 0.01 mGy/h and which meets the prescribed metrological requirements.

Measurement of the absorbed dose of gamma radiation in the air shall be performed by calibrated thermoluminescent (hereinafter referred to as the "TL") dosimeters which meet the prescribed metrological requirements.

Measurement of the specific activity of radionuclides in the samples taken from the environment shall be performed by gamma and alpha spectrometric measurements and by means of specific methods for certain radionuclides, in accordance with the current methods and recommendations of the International Atomic Energy Agency.

Gamma spectrometric measurement of specific activities of radionuclides in a sample implies measurement in the energy range from 40 keV to 2700 keV, by means of a computerised gammaspectrometer with a semiconductor detector that meets the prescribed metrological requirements.

Alpha spectrometric measurement of specific activities of radionuclides in samples taken from the environment implies measurement by means of an alphaspectrometer that meets the prescribed metrological requirements.

Specific methods for determination of contents of radionuclides imply measurements of activity, by means of duly calibrated alpha, beta and gamma counters, i.e. by means of adequately calibrated spectrometers, of the samples previously prepared by the radiochemical or other standard method.

II SYSTEMATIC EXAMINATION OF THE CONTENTS OF RADIONUCLIDES IN NORMAL CONDITIONS

Examination of the level of external radiation

Intensity of the absorbed dose of gamma radiation in the air shall be continuously measured in the course of 24 hours, every day, in Belgrade, Vinča, Kladovo, Subotica, Niš, Šid, Zaječar, Novi Sad, Priština and Podgorica, at the elevation of 1 m above a non-cultivated grass surface.

Measurement of the absorbed dose of gamma radiation shall be performed by TL dosimeters placed at the elevation of 1 m above a non-cultivated grass surface in Belgrade, Vinča, Kladovo, Prahovo, Golubac, Palić, Subotica, Novi Sad, Sremska Mitrovica, Vršac, Šid, Šabac, Apatin, Obrenovac, Užice, Kostolac, Kraljevo, Kragujevac, Đerdap, Zaječar, Kruševac, Niš, Vranje, Lazarevac, Kosovska Mitrovica, Priština, Pirot, Podgorica and Bar, with the replacement and reading performed once in each six-month period.

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Examination of the contents of radionuclides in the air

Air samples for examination of the contents of radionuclides shall be taken in Belgrade, Vinča, Subotica, Novi Sad, Zaječar, Kladovo, Niš, Šid, Vršac, Kragujevac, Priština and Podgorica.

Samples shall be taken incessantly in the course of 24 hours, every day, by suctioning of at least 300 m³ of air through a filtering paper of a known efficiency, at the level of 1 m above a non-cultivated grass surface.

Samples of aerosols taken on each individual day in the course of one month period (hereinafter referred to as the "daily samples") shall be blended at the end of a month (hereinafter referred to as the "cumulative monthly samples") and gammaspectrometrically examined not later than the first half of the following month for the preceding month.

Specific measurements of ⁹⁰Sr shall be performed on samples taken in the course of three months (hereinafter referred to as the "cumulative quarterly samples").

Examination of the contents of radionuclides in solid and liquid precipitation

Samples of solid and liquid precipitation are taken in Belgrade, Vinča, Subotica, Novi Sad, Priština, Niš, Šid, Vršac, Zaječar, Kragujevac, Kosovska Mitrovica and Podgorica.

Samples of precipitation referred to in paragraph 1 hereof shall be collected incessantly in the course of 24 hours at the elevation of 1 m above the ground level and these shall be taken each day at 6 hours and 30 minutes Co-ordinated Universal Time (UTC). Quantity of precipitation is also registered during collection of samples.

Gammaspectrometric and specific measurement of the contents of ⁹⁰Sr shall be performed on cumulative monthly samples of precipitation.

Examination of the contents of radionuclides in rivers, lakes and the sea

Samples of water for examination of the contents of radionuclides in rivers shall be taken on daily basis from

- 1) the Danube river at Bezdan, Novi Sad, Zemun, Vinča, Golubac, Đerdap (a lake) and Prahovo;
- 2) the Sava river at Sremska Mitrovica, Šabac and Belgrade;
- 3) the NIšava river at Pirot;
- 4) the Tisa river at Kanjiža;
- 5) the Timok river at Knjaževac;
- 6) the Drina river at Loznica.

Samples of water and suspended substances taken at the places referred to in item 8 provisions 1 and 2 hereof shall be tested gammaspectrometrically on cumulative monthly samples.

Samples of water taken at the places referred to in item 8 provisions 3 to 6 hereof shall be tested gammaspectrometrically on cumulative quarterly samples.

Specific measurement of ⁹⁰Sr shall be performed on cumulative quarterly samples of water taken at each individual place referred to in item 8 hereof, while samples of water taken from the Danube and Sava rivers shall be subjected to specific measurement of ³H as well on a cumulative monthly sample.

Samples of the riverbed sediments at the depth of 0 to 10 cm as well as samples of various species of fish (common carp, sheatfish, etc.) shall be taken at the places referred to in item 8 hereof once in each six-month period).

Samples referred to in paragraph 1 hereof shall be examined gammaspectrometrically and by specific measurement of ⁹⁰Sr.

The contents of radionuclides in the water of the Skadar lake near the state border shall be examined gammaspectrometrically and by specific measurement of ⁹⁰Sr on cumulative quarterly samples.

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Samples of sea water for examination of the contents of radionuclides shall be taken on daily basis in Bar and Herceg Novi and cumulative monthly samples shall be examined gammaspectrometrically and by specific measurement of ^{90}Sr .

Samples of at least two species of indicator organisms (cuttlefish and mussel) shall be taken once in a six-month period at the places referred to in item 12 hereof.

Samples referred to paragraph 1 hereof shall be examined gammaspectrometrically and by specific measurement of ^{90}Sr .

Examination of the contents of radionuclides in soil

Samples of soil for examination of the contents of radionuclides shall be taken in Belgrade, Vinča, Novi Sad, Subotica, Šabac, Užice, Golubac, Niš, Zaječar, Priština and Podgorica.

Samples of non-cultivated grass surfaces shall be taken in places referred to in paragraph 1 hereof in the course of April and October each year, from the depth down to 5 cm and from 5 cm down to 15 cm, while samples of cultivated soil shall be taken from the depth of 20 cm.

Samples taken from places referred to in paragraph 1 hereof shall be examined gammaspectrometrically and by specific measurement of ^{90}Sr .

Examination of the contents of radionuclides in potable water

Samples of potable water from a water supply system which provides water to settlements with more than 100,000 inhabitants shall be taken on daily basis and cumulative quarterly samples shall be examined gammaspectrometrically.

Contents of radionuclides in potable water from a water supply system that takes water from a river whose upstream catchment area contains nuclear facilities shall be examined also by specific measurement of the contents of ^{90}Sr and ^3H in cumulative quarterly samples.

If in a river upstream from the place at which a water supply system is provided with water there is any facility which could contaminate this water above the allowed levels, provisions as under item 15 hereof shall apply, while also performing specific measurements, in each particular case, of the radionuclides that might be discharged into the river from such a facility.

Samples of potable water from tanker lorries shall be taken from each individual tank lorry from the territory of each municipality if at least 50% of the population is supplied with water in this way.

Samples referred to in paragraph 1 hereof shall be taken on daily basis and cumulative semiannual samples shall be examined by means of gammaspectrometric analysis and by specific measurement of ^{90}Sr .

Examination of the contents of radionuclides in foodstuffs and items of general use

The contents of radionuclides in foodstuffs shall be examined on samples of milk, beef, bread (made of wheat or corn flour), beans, cabbage, grapes, apples and potato.

The contents of radionuclides in items of general use shall be examined on samples of tobacco and substances for public hygiene.

Samples of foodstuffs referred to in paragraph 1 hereof shall be taken in Belgrade, Subotica, Šabac, Novi Sad, Užice, Zaječar, Priština and Podgorica.

Samples of items of general use referred to in paragraph 2 hereof shall be taken in Belgrade and Podgorica.

Samples of milk shall be taken on daily basis from the purchase network of dairy plants in places referred to in paragraph 3 hereof, while cumulative monthly samples from each place mentioned therein shall be analysed separately.

Samples of foodstuffs shall be taken from primary production and the contents of radionuclides shall be examined in accordance with ripening of vegetation and breeding (for meat).

Samples of items of general use shall be taken once a year and examined by gammaspectrometric measurements.

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Composite mixed monthly samples of children's food from canteens (kindergartens, four samples a year) in Belgrade, Novi Sad, Priština and Podgorica shall be taken separately.

Samples of foodstuffs shall be tested gammaspectrometrically and by specific measurement of the contents of ^{90}Sr .

Examination of the contents of radionuclides in livestock feedstuffs

Examination of the contents of radionuclides in livestock feedstuffs comprises as follows:

- 1) fresh bulky feed (meadow grass, clover, lucerne, legumes, fodder beet, silage);
- 2) dry bulky feed (hay, reed, straw);
- 3) fodder mixtures for nutrition of various species and categories of animals (dairy cows, beef cattle, sheep, fattening lambs and hog sheep, breeding swines, swines fattened up to 150 days and fatlings up to 210 days, laying hens and broilers).

Samples of livestock feedstuffs for examination of the contents of radionuclides shall be taken from primary production in places referred to in item 13 paragraph 3 hereof, once in a six-month period.

Examination of the level of exposure to ionising radiation in dwelling premises and in working environment

Examination of the level of exposure in dwelling premises shall be performed by measurement of the absorbed dose of gamma radiation in the air, intensity of the absorbed dose of gamma radiation in the air, concentration of radon in the air and the contents of radionuclides in samples of air in dwelling premises (apartments, schools, kindergartens).

Measurements referred to in paragraph 1 hereof shall be performed twice a year in Belgrade, Podgorica, Novi Sad, Priština and Knjaževac, in 30 apartment buildings per each of these cities (in the cellar, on the groundfloor, on the first floor and on the second floor).

Examination of the contents of radionuclides in working environment in mines and industry plants (plants for treatment of phosphates and production of artificial fertilizers, etc.) in which levels of exposure to ionising radiation exceed the prescribed limits for the population shall be performed by measuring the concentration of radon in the air and the intensity of an equivalent dose in a working space

Measurement of concentration of radon in working spaces referred to in paragraph 1 hereof shall be performed twice a year, while measurement of intensity of an equivalent dose and contamination level in these spaces shall be performed once a year.

Examination of the contents of radionuclides in building materials

The contents of radionuclides in building materials shall be examined once a year in samples of cement, sand, brick, gypsum, siporex, ceramic tiles, marble and granite.

Samples of materials shall be taken directly from respective manufacturers of the building materials referred to in paragraph 1 hereof, separately for each material.

The contents of radionuclides in samples of the building materials referred to in paragraph 1 hereof shall be examined gammaspectrometrically.

III EXAMINATIONS IN THE CONTEXT OF SUSPICION OF AN EMERGENCY EVENT AND DURING AN EMERGENCY EVENT

If the measured value of intensity of the absorbed dose of gamma radiation in the air in some of the sites is by 20% higher than the maximum measured value in the previous one-year period for the given site, an authorised legal entity which performs systematic control of radioactivity of the environment shall become alerted and take measures in order to establish causes for increase in intensity of the dose and forthwith advise the Federal Ministry of Labour, Health and Social Policy thereof.

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If intensity of the absorbed dose in the air shows further increase or if short-lived artificial radionuclides occur in the gamma spectre of the air, an authorised legal entity referred to in paragraph 1 hereof shall advise the Federal Ministry of Labour, Health and Social Policy thereof so that necessary measures might be taken.

FINAL PROVISIONS

The Rulebook on places and time intervals of systematic examination of the contents of radionuclides in the environment, early detection and notification of radioactive contamination of the environment (Official Gazette of the Socialist Federal Republic of Yugoslavia 84/91) shall be repealed from the date of entry into force of this decision.

This decision shall enter into force on the eighth day following that of its publication in the Official Gazette of the Federal Republic of Yugoslavia.