

15 Annex - Energy

**89. DECISION ON THE REQUIREMENTS TO BE MET BY
LEGAL ENTITIES FOR CARRYING OUT MEASUREMENTS
OF THE DEGREE OF EXPOSURE TO IONISING RADIATION
OF PERSONS WORKING WITH RADIATION SOURCES,
PATIENTS AND THE POPULATION**

89. DECISION ON THE REQUIREMENTS TO BE MET BY LEGAL ENTITIES FOR CARRYING OUT MEASUREMENTS OF THE DEGREE OF EXPOSURE TO IONISING RADIATION OF PERSONS WORKING WITH RADIATION SOURCES, PATIENTS AND THE POPULATION

DECISION

ON THE REQUIREMENTS TO BE MET BY LEGAL ENTITIES FOR CARRYING OUT MEASUREMENTS OF THE DEGREE OF EXPOSURE TO IONISING RADIATION OF PERSONS WORKING WITH RADIATION SOURCES, PATIENTS AND THE POPULATION

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

I. BASIC PROVISIONS

1. This Decision provides for the requirements with regard to staff, equipment and space to be met by legal entities for carrying out measurements in order to assess the degree of exposure to ionising radiation of persons working with radiation sources (hereinafter referred to as the “professionally exposed persons”), patients and the population.
2. Instruments used for measuring the degree of exposure to ionising radiation must meet the prescribed metrological standards.

II. DOSIMETRIC MEASUREMENTS AND CONTROL OF WORKING ENVIRONMENT

3. Legal entities may carry out dosimetric measurements and control of working environment provided they have

a) Staff

- 1) a graduate electrical engineer – with the major in technical physics or a person with a university degree in physics, who has a master degree or specialisation in protection against ionising radiation and three years of working experience on tasks of protection against ionising radiation;
- 2) a graduate electrical engineer – with the major in technical physics or a person with a university degree in physics, who has three years of working experience on tasks of protection against ionising radiation and has been trained for carrying out measures for protection against ionising radiation;
- 3) a persons who has acquired at least IV (secondary school) degree of vocational education in electrical engineering, trained for carrying out measures for protection against ionising radiation.

b) Equipment

- 1) portable dosimeters for measurement of the intensity of equivalent dose of gamma radiation, low-energy gamma and X radiation;
- 2) portable contamination monitor with a set of probes for alpha, beta, low-energy gamma and gamma radiation;
- 3) portable air sampling device;
- 4) instruments for measurement of activities of filters and swabs (alpha, beta and gamma counters and gamma and alpha spectrometers);
- 5) set of verified radioactive sources working measurement standards for all the parameters;

c) Space – premises for laboratory equipment for measurement of activities of filters and swabs.

Apart from the equipment referred to in the sub-item 1 of this item, the legal entity carrying out dosimetric control of neutron ionising radiation sources shall also have portable instruments for measurement of the intensity of equivalent dose of neutron radiation.

The legal entity carrying out dosimetric control of low-energy beta active ionising radiation sources shall have a portable monitor of surface contamination with low-energy beta emitters and a portable monitor of air contamination with low-energy beta emitters.

III. MEASURING A DEGREE OF INDIVIDUAL EXTERNAL EXPOSURE OF PROFESSIONALLY EXPOSED PERSONS (PERSONAL DOSIMETRIC CONTROL)

89. DECISION ON THE REQUIREMENTS TO BE MET BY LEGAL ENTITIES FOR CARRYING OUT MEASUREMENTS OF THE DEGREE OF EXPOSURE TO IONISING RADIATION OF PERSONS WORKING WITH RADIATION SOURCES, PATIENTS AND THE POPULATION

4. Legal entities may carry out personal dosimetric control of professionally exposed persons provided they have

a) Staff

1) a graduate electrical engineer – with the major in technical physics or a person with a university degree in physics, who has a master degree or specialisation in protection against ionising radiation and three years of working experience on tasks of protection against ionising radiation;

2) a graduate electrical engineer – with the major in technical physics or a person with a university degree in physics, who has three years of working experience on tasks of protection against ionising radiation and has been trained for carrying out measures for protection against ionising radiation;

3) a persons who has acquired at least IV (secondary school) degree of vocational education in electrical engineering, trained for carrying out measures for protection against ionising radiation.

b) Equipment

1) Thermoluminescent dosimeter (for gamma and neutron radiation, for the entire body and for limbs);

2) a reader of thermoluminescent dosimeters, with a possibility of developing and maintaining data base on degrees of exposure of exposed personnel;

3) radioactive etalon source for calibration of thermoluminescent dosimeters;

c) Space

1) premises for reading of dosimeters and keeping records of professionally exposed persons;

2) premises for calibration of dosimeters;

3) premises for admission, preparation and packing and sending of dosimeters.

IV. MEASUREMENTS OF A DEGREE OF INDIVIDUAL INTERNAL EXPOSURE OF PROFESSIONALLY EXPOSED PERSONS

5. Legal entities may carry out measurements of the radionuclide activity in samples of biological material from professionally exposed persons provided they have

a) Staff

1) a graduate electrical engineer – with the major in technical physics or a person with a university degree in physics, who has a master degree or specialisation in protection against ionising radiation and three years of working experience on tasks of protection against ionising radiation;

2) a person with a university degree in chemistry or physical chemistry or pharmacy, who has three years of working experience on tasks of protection against ionising radiation and has been trained for carrying out measures for protection against ionising radiation;

3) a person who has acquired at least IV (secondary school) degree of vocational education in chemistry, trained for carrying out measures for protection against ionising radiation;

b) Equipment

1) liquid scintillation counter for measurement of activities of low-energy beta emitters;

2) semi-conducting gammaspectrometer for measurement of activities of gamma emitters in samples;

3) alpha-beta counters and alpha spectrometers;

4) equipment and tools for display of results and dose evaluation;

5) equipment and accessories for collection and preparation of samples;

89. DECISION ON THE REQUIREMENTS TO BE MET BY LEGAL ENTITIES FOR CARRYING OUT MEASUREMENTS OF THE DEGREE OF EXPOSURE TO IONISING RADIATION OF PERSONS WORKING WITH RADIATION SOURCES, PATIENTS AND THE POPULATION

c) Space

- 1) a laboratory for preparation of samples;
- 2) a laboratory for determination of the isotopic composition and measurement of activities of alpha, beta and gamma emitters (low-phonic laboratory).

Legal entities may conduct measurements of the total activity of radionuclides in the entire body or in an organ of a professionally exposed person provided they have

a) Staff

1) a graduate electrical engineer – with the major in technical physics or a person with a university degree in physics, who has a master degree or specialisation in protection against ionising radiation and three years of working experience on tasks of protection against ionising radiation;

2) a graduate electrical engineer – with the major in technical physics or a person with a university degree in physics, who has three years of working experience on tasks of protection against ionising radiation and has been trained for carrying out measures for protection against ionising radiation;

b) Equipment – counter of activities of the entire body with computerised data processing and appropriate calibration phantoms;

c) Space – premises for carrying out measurements in which the intensity of the equivalent dose is lesser than the natural phon in the open space (low-phonic premises).

89. DECISION ON THE REQUIREMENTS TO BE MET BY LEGAL ENTITIES FOR CARRYING OUT MEASUREMENTS OF THE DEGREE OF EXPOSURE TO IONISING RADIATION OF PERSONS WORKING WITH RADIATION SOURCES, PATIENTS AND THE POPULATION

V. BIODOSIMETRIC MEASUREMENTS OF INDIVIDUAL EXPOSURE TO IONISING RADIATION

6. Legal entities may carry out biodosimetric measurements of individual exposure to ionising radiation provided they have

a) Staff

1) a person with a university degree in biology with additional specialisation in cytogenetics or a medical doctor with a specialisation in cytogenetics, who has been trained for carrying out measures for protection against ionising radiation and has three years of working experience on tasks of protection against ionising radiation;

2) a person who has acquired at least IV (secondary school) degree of vocational education in chemistry or medicine, trained for carrying out measures for protection against ionising radiation;

b) Equipment

1) microscope;

2) thermostat;

3) sterile chamber;

4) laboratory dryer;

5) mixer;

6) centrifuge;

7) vacuum-pump;

8) photographic equipment for development of films and making of micro-photographs;

c) Space

1) premises for taking blood samples;

2) premises for preparation of samples and nutritive media for cultivation of lymphocytes and chromosome aberrations analysis;

3) premises for reading of findings and record keeping.

VI. MEASUREMENTS FOR THE PURPOSE OF CARRYING OUT PROGRAMMES OF QUALITY ASSURANCE AND CONTROL

7. Legal entities may carry out measurements for the purpose of carrying out programmes of assurance and control of quality of ionising radiation sources in X-ray diagnostics, nuclear medicine and radiotherapy, provided they have

a) Staff

1) a graduate electrical engineer – with the major in technical physics or a person with a university degree in physics, who has a master degree or specialisation in protection against ionising radiation and three years of working experience on tasks of protection against ionising radiation;

2) a graduate electrical engineer – with the major in technical physics or a person with a university degree in physics, who has three years of working experience on tasks of protection against ionising radiation and has been trained for carrying out measures for protection against ionising radiation;

b) Equipment

1) portable dosimeters for measuring the intensity of equivalent dose and equivalent dose of gamma radiation, low-energy gamma and X-radiation;

2) equipment for measurement of spatial distribution of intensity of equivalent dose;

89. DECISION ON THE REQUIREMENTS TO BE MET BY LEGAL ENTITIES FOR CARRYING OUT MEASUREMENTS OF THE DEGREE OF EXPOSURE TO IONISING RADIATION OF PERSONS WORKING WITH RADIATION SOURCES, PATIENTS AND THE POPULATION

- 3) appropriate phantoms (in accordance with the requirements of current standards);
 - 4) equipment for measurement of free ion concentration in the air;
 - 5) equipment for measurement of air flow;
 - 6) equipment for non-invasive measurement of high voltage of the x-ray tube;
 - 7) equipment for measurement of the time of imaging;
 - 8) equipment for determination of compatibility between illuminated and irradiated fields;
 - 9) equipment for determination of verticality of referent axis of x-ray radiation beam;
 - 10) equipment for determination of size and shape of the x-ray tube focus;
 - 11) equipment for determination of thickness of semi-weakening and filtration;
 - 12) equipment for determination of resolution;
 - 13) equipment for determination of basic darkening of the film;
 - 14) equipment for control of processing and analysis of exposed film;
 - 15) equipment for measurement of temperature of the developer and the fixer;
 - 16) equipment for control of functionality of instruments (verified working measurement standards of radioactive sources of radiation);
 - 17) portable dosimeter with a measuring phantom and two ionising chambers calibrated for the measuring scope of radiotherapy devices;
 - 18) equipment for measurement of activities of radio-pharmaceuticals;
 - 19) portable contamination monitor with a set of probes for alpha, beta, low-energy beta, low-energy gamma and gamma radiation;
 - 20) equipment for measurement of uniformity of detectors in nuclear medicine;
 - 21) equipment for determination of resolution of detectors in nuclear medicine;
 - 22) equipment for measurement of sensitivity of detectors in nuclear medicine;
 - 23) equipment for determination of the rotation centre of a detector in nuclear medicine;
- c) Space
- 1) premises for control of functionality of instruments;
 - 2) premises for storage of instruments;
 - 3) premises for developing of films (dark chamber).

VII. DESIGNING OF MEASURES FOR PROTECTION AGAINST IONISING RADIATION

8. Legal entities may carry out designing of measures for protection against ionising radiation provided they have

a) Staff

- 1) a graduate electrical engineer – with the major in technical physics or a person with a university degree in physics, who has a master degree or specialisation in protection against ionising radiation and three years of working experience on tasks of protection against ionising radiation;
- 2) a graduate electrical engineer – with the major in technical physics or a person with a university degree in physics, who has three years of working experience on tasks of protection against ionising radiation and has been trained for carrying out measures for protection against ionising radiation;

89. DECISION ON THE REQUIREMENTS TO BE MET BY LEGAL ENTITIES FOR CARRYING OUT MEASUREMENTS OF THE DEGREE OF EXPOSURE TO IONISING RADIATION OF PERSONS WORKING WITH RADIATION SOURCES, PATIENTS AND THE POPULATION

b) Equipment – programs for calculation of protection and IT equipment for evaluation and processing of data;

c) Space – premises for IT equipment and project documentation.

VIII. FINAL PROVISION

9. This Decision shall enter into force on the eighth day following that of its publication in the Official Gazette of the FRY.