

# **RULEBOOK**

## **FOR ESTABLISHING PROGRAMME OF ADDITIONAL TRAINING AND SPECIALIZED EDUCATION OF OCCUPATIONALLY EXPOSED PERSONS AND PERSONS RESPONSIBLE FOR IMPLEMENTATION OF RADIATION PROTECTION MEASURES**

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### **Article 1**

This Rulebook shall establish a Programme Of additional training and specialized education of occupationally exposed persons and persons responsible for implementation of radiation protection measures. The Programme shall be attached along with this Rulebook constituting an integral part thereof.

### **Article 2**

The Programme referred to in Article 1 of this Rulebook shall determine the content and method of implementation of the Programme.

### **Article 3**

This Rulebook, upon approval by the Government, shall be published in the "Official Gazette of the Republic of Serbia" and shall enter into force on the eighth day following its publication.

## **PROGRAMME OF ADDITIONAL TRAINING AND SPECIALIZED EDUCATION OF OCCUPATIONALLY EXPOSED PERSONS AND PERSONS RESPONSIBLE FOR IMPLEMENTATION OF RADIATION PROTECTION MEASURES**

### **1. Introduction**

The Programme of additional training and specialized education of occupationally exposed persons and persons responsible for implementation of radiation protection measures (hereinafter referred to as the Programme) shall provide a uniform manner of realization and training content, continuous education, evaluation and improvement of knowledge in the field of implementation of radiation protection measures for high risk jobs due to exposure to ionizing radiation.

Certain terms used in this Rulebook shall have the following meanings:

- 1) *additional training* means additional training for working with sources of ionizing radiation;
- 2) *specialized education* means the process of systematic adoption, renewal and updating of knowledge and skills for performing radiation practices after acquiring the appropriate

education, training or specialized education relating to implementation of protective measures against ionizing radiation.

## **2. Method of implementation of the Programme**

The Programme shall be implemented through additional training, specialized education relating to implementation of radiation protection measures and periodical refreshment of knowledge.

Participants in additional training and specialized education relating to implementation of radiation protection measures during training which includes hands-on exercises with ionizing radiation sources, shall be under the direct supervision of occupationally exposed persons authorized to conduct such trainings, and a person responsible for radiation protection in accordance with the law governing radiation protection.

### *(A) Additional training for working with ionizing radiation and specialized education for implementation of radiation protection measures*

Additional training for working with sources of ionizing radiation and specialized education relating to implementation of radiation protection measures shall be performed before beginning of the activities involving sources of ionizing radiation and for the following types of work:

- 1) work with open sources of ionizing radiation, class I, II and III operations;
- 2) work with the dental X-ray devices (except for dentists, radiologists, radiology technicians, and senior radiology technicians);
- 3) work with the X-ray devices in veterinary X-ray diagnostics (except for radiologists, radiology technicians, senior radiology technicians);
- 4) work with the devices for industrial radiographic examination;
- 5) work with the measurements regulating devices in industry;
- 6) work with the X-ray machines in medicine (except for radiologists, radiology technicians, senior radiology technicians);
- 7) trade in radioactive materials.

Before beginning of the activities involving ionizing radiation sources, specialized education for the implementation of radiation protection measures shall be carried out for all persons who are occupationally exposed to ionizing radiation and persons responsible for the implementation of protective measures against ionizing radiation.

### *(b) Periodic renewal of knowledge*

Specialized education shall be performed through additional training for handling new devices within the radiation practice for which the person shall be qualified and through periodic renewal of knowledge.

Periodic renewal of knowledge shall be carried out for all occupationally exposed persons at least once in a five years.

### *(V) Method for evaluation of mastering the Programme*

After completion of additional training for working with sources of ionizing radiation and specialized education for implementation of radiation protection measures, knowledge evaluation test shall be conducted.

Knowledge evaluation shall be carried out in writing in the form of test. The participant shall respond by selecting one of three possible answers. It shall be considered that the participant responded positively to the test if he/she won at least 80% of the maximum points.

### **3. Volume and number of hours**

Total number of hours of additional training for types of work under Section 2 The method of implementation of the Programme, sub-section (a) Additional training for working with ionizing radiation and special education for implementation of radiation protection measures concerning types of work specified in paragraph 1 shall be as follows:

1) work with open sources of ionizing radiation:

(1) class I and II operations: a total of 120 hours (60 hours of theory and 60 hours of practical training)

(2) class III operations: a total of 60 hours (30 hours of theory and 30 hours of practical training);

2) work with the dental X-ray devices: a total of 20 hours (10 hours of theory and 10 hours of practical training);

3) work with the X-ray devices in veterinary x-ray diagnostics: a total of 30 hours (15 hours of theory and 15 hours of practical training);

4) work with the devices for industrial radiographic examinations:

(1) Training level I: a total of 85 hours (40 hours of theory and 45 hours of practical training)

(2) Training level II: a total of 110 hours (85 hours of theory and 25 hours of practical training);

5) work with measurements regulating devices in industry: a total of 40 hours (30 hours of theory and 10 hours of practical training);

6) work with X-ray devices in medicine: a total of 20 hours (15 hours of theory and 5 hours of practical training);

7) trade in radioactive material: a total of 20 hours (15 hours of theory and 5 hours of practical training).

The number of hours of specialized education concerning implementation of radiation protection measures for persons not included under paragraph 1 of this Section shall be a total of 20 hours (15 hours of theory and 5 hours of practical training).

The number of hours of specialized education for implementation of radiation protection measures for the persons responsible for implementation of radiation protection measures in the medical application of ionizing radiation, in order to obtain a certificate which will be issued by the Serbian Radiation Protection and Nuclear Safety Agency (hereinafter referred to as: the Agency) shall be a total of 30 hours.

The number of hours of specialized education concerning implementation of radiation protection measures for the persons responsible for implementation of radiation protection in the areas where ionizing radiation sources are applied that are not listed in paragraph 3 of this Section in order to obtain a certificate which will be issued by the Agency, shall be a total of 20 hours.

The number of hours in periodic renewal of knowledge for specialized education for implementation of radiation protection measures for all persons occupationally exposed to

ionizing radiation, except for those responsible for radiation protection in the medical application of ionizing radiation, shall be a total of 12 hours.

The number of hours for periodic renewal of knowledge for specialized education concerning implementation of radiation protection measures for the persons responsible for implementation of radiation protection in the medical application of ionizing radiation, shall be a total of 20 hours.

The number of hours of specialized education concerning implementation of radiation protection measures for the persons responsible for the implementation of radiation protection measures (use of ionizing radiation sources that must be notified), shall be a total of 6 hours.

#### **4.Content of the Programme**

The Programme shall include:

- 1) basic concepts and definitions;
- 2) fundamentals of radiation physics;
- 3) radiation dosimetry;
- 4) biological effect of radiation and radiation risk;
- 5) national legislation and international recommendations for the radiation protection, and
- 6) protection against the ionizing radiation:
  - (1) enforcement of protection in the workplace,
  - (2) monitoring of radiation exposure (persons, environment and patients),
  - (3) medical surveillance of occupationally exposed persons,
  - (4) warning signs of the dangers of radiation.

Programme for additional training shall be conducted in the following fields:

- 1) use of ionizing radiation in medicine:
  - (1) conventional X-ray diagnostics,
  - (2) dentistry
  - (3) mammography,
  - (4) invasive methods in X-ray diagnostics,
  - (5) computerized tomography,
  - (6) nuclear medicine,
  - (7) radiotherapy;
- 2) use of ionizing radiation in veterinary medicine;
- 3) use of open sources of radiation in industry, research and education;
- 4) use of sealed sources of radiation and X-ray devices in industry, research and education;
- 5) industrial radiography;
- 6) installation, maintenance and repair of ionizing radiation sources in the medical use;
- 7) trade in radioactive materials.

Programme for additional training shall relate to the type of ionizing radiation sources to which the persons are exposed, and devices that produce ionizing radiation, open or sealed radiation sources with a special focus on highly active sources.

Topics of special interest in Programme for additional training shall be processed in a volume that depends on the area of implementation and on the total number of hours:

- 1) principles of ionizing radiation sources operation;
- 2) personal monitoring of exposed persons;
- 3) protection of patients, pregnant women, persons who assist the patient;
- 4) safety in the use of high activity sources;
- 5) security of ionizing radiation source;
- 6) radioactive waste;
- 7) impact of ionizing radiation on the environment;
- 8) potential accidents and emergency procedures;
- 9) transportation of ionizing radiation sources;
- 10) quality assurance and control in the implementation of radiation protection measures.

The Programme for specialized education relating to implementation of radiation protection measures in conventional X-ray diagnostics, dentistry, mammography, invasive methods in X-ray diagnostics and computed tomography shall include:

- 1) methods of application;
- 2) justification;
- 3) application risk;
- 4) possibility of using the results of previous diagnostic procedures;
- 5) patient doses;
- 6) environmental protection;
- 7) protection of patients;
- 8) protection of workers;
- 9) justified scientific and medical research;
- 10) systematic examination of the population;
- 11) alternative medical methods;
- 12) quality control;
- 13) procedures in case of emergencies;
- 14) practical exercises.

The Programme for specialized education concerning implementation of radiation protection measures in nuclear medicine shall include:

- 1) methods of application;
- 2) justification;
- 3) application risk;
- 4) possibility of using previous diagnostic procedures;

- 5) patient doses;
- 6) environmental protection;
- 7) protection of patients;
- 8) protection of workers;
- 9) justified scientific and medical research;
- 10) alternative medicine methods;
- 11) quality control;
- 12) procedures in case of emergencies;
- 13) practical exercises;
- 14) use of radiopharmaceuticals;
- 15) safety in working with open radioactive sources;
- 16) storage of radioactive materials;
- 17) decontamination;
- 18) radioactive waste keeping and storage;
- 19) conditions for radioactive materials exemption from regulatory control.

The Programme for specialized education concerning implementation of radiation protection measures in radiotherapy shall include:

- 1) methods of application;
- 2) application justification;
- 3) application risk;
- 4) environmental protection;
- 5) protection of patients;
- 6) protection of workers;
- 7) justified scientific and medical research;
- 8) quality control;
- 9) procedures in case of emergencies;
- 10) practical exercises;
- 11) effects of large doses on biological material;
- 12) methods in radiotherapy;
- 13) radiotherapy planning;
- 14) sealed radiation sources in radiotherapy;
- 15) security of high activity radiation sources;
- 16) radioactive waste and storage.

The Programme for specialized education concerning implementation of radiation protection measures in veterinary medicine shall include:

- 1) methods of X-ray diagnostics in veterinary medicine;
- 2) application justification;

- 3) application risk;
- 4) environmental protection;
- 5) protection of workers;
- 6) protection of animals;
- 7) alternative examination methods;
- 8) quality control;
- 9) procedures in case of emergencies;
- 10) practical exercises.

The Programme for specialized education concerning implementation of radiation protection measures in use of open sources of radiation in industry, research and education shall include:

- 1) open sources and use;
- 2) protective measures in laboratories;
- 3) keeping of radioactive materials;
- 4) decontamination;
- 5) radioactive waste, release in the environment and storage;
- 6) protection of workers;
- 7) measures in case of emergency;
- 8) practical exercises.

The Programme for specialized education concerning implementation of radiation protection measures in use of sealed sources of radiation in industry, research and education shall include:

- 1) devices and use;
- 2) protection of workers;
- 3) environmental protection;
- 4) keeping of radioactive materials;
- 5) radioactive waste;
- 6) special protective measures during installation, repair and maintenance of sources and devices;
- 7) measures in the case of emergency;
- 8) practical exercises.

The Programme for specialized education concerning implementation of radiation protection measures in industrial radiography shall include:

- 1) devices and application;
- 2) indoor protection measures;
- 3) outdoor protection measures;
- 4) protection of workers;
- 5) conditions for use, maintenance and repair;
- 6) measures in case of emergency;

7) practical exercises.

The Programme for specialized education concerning implementation of radiation protection measures during installation, maintenance and repair of ionizing radiation source in medicine shall include:

- 1) devices and use;
- 2) protection of workers;
- 3) components of devices and procedures that have direct effect to the safety of patients;
- 4) measures in case of emergency;
- 5) practical exercises.

The Programme for specialized education concerning implementation of radiation protection measures in trade in radioactive materials shall include:

- 1) responsibility and obligations in trade in radiation sources;
- 2) open and sealed sources and its handling;
- 3) radioactive waste and release and disposal in the environment;
- 4) protection of workers;
- 5) measures in case of emergency.