

## Field: RADIATION PROTECTION

# Topic: INSPECTION OF ENVIRONMENTAL AND OCCUPATIONAL RADIATION PROTECTION

<b>Course type</b>	TUTORING	<b>Objective</b>
<b>Host institute</b>	National Center for Public Health and Pharmacy Budapest, Hungary	This course provides the tutees with theoretical and practical information on the background activities supporting regulatory decisions in radiation protection, including environmental radioactivity measurements and control (with particular focus on radon and its progeny) and personal monitoring. The course assists the tutees to improve knowledge in technical disciplines, and competences related to regulatory functions and processes, including authorization, review, assessment and inspection.
<b>Date</b>	12 February – 8 March 2024	
<b>Duration</b>	Four weeks	
<b>Working language</b>	English	

### Outline of course content

#### Theoretical training

- Introduction to the EU regulatory framework on the safe use of radiation sources for peaceful purposes.
- Introduction of the national regulatory framework, nuclear safety requirements of medical and industrial facilities and the related regulatory activities. The interpretation of the EU regulations in Hungary.
- Introduction to technical inspections, nuclear instrumentation, individual monitoring and semiconductor detectors for the measurement of ionising radiation (isotopes, radioactive decay, decay chains and radiation doses, impact of ionizing radiation on human body, calculation and measurement methods of external and internal doses, natural and man-made radionuclides, their appearance in the environment).
- Introduction to radon measurements, indoor radon concentrations and national radon reference levels.
- Introduction to the medical uses of ionising radiation. Safety assessment of uses of ionising radiation in medicine. Introduction to the authorisation procedure, life-cycle of the equipment in the clinical settings. Interpretation of "strict surveillance" for radiation sources in the medical environment. Fundamentals of safety assessment in the case of clinical trials involving ionising radiation. Quality management, quality assurance and quality control in medical exposures.

#### Practical training

- Laboratory activities and hands-on exercises:
  - for the environmental sample collection and preparation of samples collected from different sites of interest to process these for evaluation with nuclear instruments, including gamma spectrometry and liquid scintillation counting;
  - for the evaluation of the performance of thermoluminescent dosimeters used for environmental and personal dosimetry, including their irradiation and evaluation of responses, introduction to the arrangements on record keeping of individual monitoring results for planned and emergency exposure situations;
  - with active and passive radon measurement methods, the assessment of radiogenic potential from building materials and indoor gamma-surveys;
  - with whole body counter and determination of internal dose from derived activities of earlier publications;
  - for the instrumentation for non-invasive testing of medical X-ray equipment, test objects and methods to evaluate the performance of diagnostic imaging modalities using ionising radiation.
- Technical visits:
  - site visits to different industrial and medical facilities in Hungary;
  - site visits to irradiation facilities available in Hungary;
  - laboratory visits to analytical laboratories supporting the regulation of industrial applications (using mostly non-destructive techniques).

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### **Technical schedule and delivery methods**

The course consists of classroom lectures, laboratory activities, hands-on trainings and site visits during the 4 working weeks (i.e. 4 × 5 workdays).

- **Classroom lectures** will take 10 days with 2 units per a day (tentatively morning and afternoon sessions with 2 lectures of 90 minutes each, with time allocated for discussions and appropriate breaks).
- **Laboratory activities and hands-on exercises** will take 8 days with morning and afternoon sessions.
- **Technical visits** will take 2 days.

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### **Target audience**

This course is intended to experts and professionals of Nuclear Regulatory Authorities (NRAs) and Technical Support Organisations (TSOs) involved in industrial and medical activities using radioactive materials.

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### **Target number of participants: 2**

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### **Prerequisites and requirements for participants**

Participants should have an adequate level of knowledge in English (at least an 'Independent user' level defined by the [CEFR](#)). A university degree with nuclear or environmental specialization and at least 2 years of professional experience in functions relevant to the content of the course is also a prerequisite.

Relevancy of the course topic in the work and institutionally justified interest in participating will be considered as well as the need and opportunity for filling competence gaps. Efforts are made to ensure gender equality.

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### **Terms of participation**

The project is implemented under the European Union (EU) external assistance programme, called the European Instrument for International Nuclear Safety Cooperation (INSC), and aims to support the National Nuclear Regulatory Authorities (NRAs) and their Technical Support Organisations (TSOs) in non-EU countries in strengthening their capabilities with regard to their regulatory tasks and responsibilities in the field of nuclear safety and radiation protection.

Employees of the NRAs or their TSOs in the Beneficiary Countries are eligible for financially supported participation in the T&T courses. Beneficiary Countries of the project are published on the website <https://training.ek-cer.hu/>.

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### **Costs**

Travel and accommodation costs and subsistence allowances (including the international and national travel tickets, shuttle services, insurance and visa costs, per diems) for participants will be covered from the project budget.

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### **Application**

Application via the website <https://training.ek-cer.hu/>, according to the process and deadlines indicated there.

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### **Examination**

Technical and linguistic tests will be written as part of the application and selection process to assess the underlying knowledge and preparedness of applicants. Knowledge and development of selected participants will be assessed through technical tests throughout the course.

Work reports will be prepared to allow for progress monitoring and determining the final development through acquisition of knowledge, practical experience and expertise, as well as task completions.

Participants attending the full course will be issued with attendance certificates. Successful participants will receive certificates confirming their knowledge achieved and skills acquired.

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