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Version 1

Field: NUCLEAR SAFETY

Topic: SAFETY AND LICENSING OF SMALL MODULAR REACTORS (SMRs)

Course type	TUTORING
Host institute	ENEA Bologna, Italy
Date	22 April – 17 May 2024
Duration	Four weeks
Working language	English

Objective

Participants will be introduced to the small modular reactor (SMR) concepts, with a particular focus on light water SMR designs. The tutoring will provide theoretical background and 1) information on public technical data of these plants, 2) an overview of the main phenomena characterizing the selected plants, with particular emphasis on their safety systems, including the behavior of passive ones, 3) information on validated codes that can be used in the licensing process.

Outline of course content

The tutoring (on-the-job training) course provides theoretical and hands-on, practical training related to the following topics:

- Overview of SMR concepts.
- Introduction of the main phenomena involved in the SMR technology (natural circulation, primary/containment coupling, behavior of large water pools etc.).
- Scaling methodology to support SMR experimental activities.
- Introduction to the main IAEA safety standards and guides with relevance for SMRs.
- Introduction to deterministic and probabilistic safety analyses for SMRs.
- Main tools used for thermal-hydraulic and severe accident analyses.
- Methodology for assessing the reliability of passive safety systems.
- Elements of Emergency Planning Zones for SMRs.

Site visits will take place to experimental facilities available in Italy to support the characterization of the main phenomena involved in SMRs.

Technical schedule and delivery methods

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

Target audience

This course is intended for experts and professionals of Nuclear Regulatory Authorities (NRAs) and Technical Support Organisations (TSOs) involved in research and development (R&D) and licensing activities for SMRs.

Target number of participants: 2

Prerequisites and requirements for participants

Participants should have basic nuclear safety and radiation protection knowledge and an adequate level of knowledge in English (at least an 'Independent user' level defined by the CEFR). A university degree with nuclear 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.

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/.

Costs

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

Application

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

Examination

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

Work reports will be prepared by the participants to allow for progress monitoring and determining their 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.