

## Field: NUCLEAR SAFETY

## Topic: DETERMINISTIC SAFETY ASSESSMENT

<b>Course type</b>	TUTORING	<b>Objective and learning outcomes</b> This course provides the tutee with theoretical background on the safety assessments, with particular focus on nuclear technology aspects important to design basis analysis, as well as practical skills through the familiarization with a system thermal hydraulic computer code and the associated safety analysis method. The course thus enables tutees to improve their technical discipline competences in related fields.
<b>Host institute</b>	VUJE Trnava, Slovak Republic	
<b>Date</b>	25 March – 19 April 2024	
<b>Duration</b>	Four weeks	
<b>Working language</b>	English	

### Outline of course content

The course primarily focuses on the preparation and review of design basis deterministic safety analyses and includes practical exercises on review of selected parts of the Safety Analysis Report of existing Nuclear Power Plants (NPPs).

- Introduction of EU and international (e.g. IAEA) standards for safety assessment requirements, Slovak nuclear regulations for the analysis of design basis accidents and use of the analysis for licensing NPPs.
- Description of the approach applied for safety analyses.
- Definition of initial and boundary conditions for safety analysis.
- Overview of used acceptance criteria for deterministic safety analyses and methodology for evaluation of acceptance criteria.
- Identification and categorization of postulated initiating events.
- Familiarization with the features and capabilities of computer codes for the design basis analysis.
- Detailed introduction of the fully integrated, engineering-level computer code RELAP5 and its dedicated applications.
- Introduction and explanation of methods of using the results of the deterministic design basis analysis.
- On-the-job training on transient and design basis accident analysis:
  - introduction of input model development,
  - calculation(s) and presentation of results,
  - interpretation and evaluation of results,
  - evaluation of relevant acceptance criteria.

### 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).

- **Classroom lectures** take 9 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).
- **On-the-job training** on transient and design basis accident analysis take 9 days.
- The 2-day **site visits** include full scale simulator in Trnava and NPP Mochovce or NPP Bohunice.

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### **Target audience**

This course is intended for experts and professionals of Nuclear Regulatory Authorities (NRAs) and Technical Support Organisations (TSOs) with responsibilities in the field of nuclear safety, particularly in the preparation and review of design basis deterministic safety analyses.

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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 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 as well as 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 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.

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