

Field: NUCLEAR SAFETY

Topic: DETERMINISTIC SAFETY ASSESSMENT

Course type	TUTORING	Objective
Host institute	Centre for Energy Research	This course provides the tutees with theoretical background on fuel behavior, with particular focus on the safety criteria and on the importance of validation, as well as practical skills through the familiarization with a fuel performance computer code and its validation. The course thus enables tutees to improve their technical discipline competences in deterministic safety assessment applications.
Location	Prague, Czech Republic	
Date	25 March – 19 April 2024	
Duration	Four weeks	
Working language	English	

Outline of course content

Theoretical training:

- Short introduction to the basics of deterministic safety analysis, including the defense in depth, postulated initiating events, conservative vs. BEPU (Best-Estimate Plus Uncertainty) methodology.
- Overview of the main fuel assembly types and introduction to the fundamentals of nuclear fuel behavior during normal operation, anticipated operational occurrences and design basis accidents.
- Familiarization with internationally applied fuel safety criteria and the purpose of each.
- Introduction to code validation.
- More detailed introduction to an engineering-level computer code.

On-the-job training on fuel performance analysis and code validation for the purpose of licensing:

- creation of inputs,
- simulations and visualization, evaluation and interpretation of results,
- using the results for code validation purposes,
- documentation of the results.

Facility visit (NPP or research reactor)

Technical schedule and delivery methods

The course will take 4 working weeks (i.e. 4 × 5 workdays).

- **Classroom lectures and facilitated discussions** on the theoretical items described above will take 5 days with 2 units per day (lectures or discussion periods of 90 minutes each), with appropriate time allocated for breaks.
- **On-the-job training** using a fuel performance analysis code, and documentation of the results will take 14 days, with an average of 3 hours of facilitated discussions per day on an as-needed basis.
- **The facility visit** will take 1 day.

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.

Target number of participants: 2

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, mechanical engineering or materials science specialization and 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.
