

Simulating Reactor Functioning during Incident and Accident - SOFIA

Session: Consult on-line training schedule

Registration deadline: 3 months prior to course

Duration: 5 days

Certificate of attendance will be issued to participants who attend the full course.

Price: Contact us

The maximum number of students is limited to eight participants.

Code: CO1023

[REGISTER NOW](#)

Contact

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Online catalogue

www.enstti.eu/training-catalogue

Examination:

Knowledge testing (multiple choice exam) will be performed on the full course content and successful candidates will be issued with a Knowledge Certificate.

Teaching methods:

Lectures, discussions and practical sessions are included. Working group exercises and technical visits are supervised by experienced TSO experts.

A USB stick containing the course material will be provided.



OBJECTIVES

To acquire a working knowledge of the SOFIA simulator for observation of functioning under incident and accident conditions.

TARGET AUDIENCE

This training is intended for engineers who wish to acquire general knowledge in functioning physics and safety of pressurized water reactors (PWR) under normal and accident conditions.

PREREQUISITES

Participants should have some basic knowledge of PWRs.

LEARNING OUTCOMES

Participants will acquire:

- A better understanding of the physical phenomena that occur in a PWR during normal operation, especially during the startup stage and under accident conditions.
- A global view of the main systems of the nuclear island used in normal and accident conditions, and of how they interact.
- An understanding of the main steps in normal operational procedures as the function of the main automatic controls of the plant unit, for different states of the plant (from cold shutdown state for maintenance to full power operation).
- An understanding of the main operational safety procedures under accident conditions (LOCA, SGTR).
- The ability to assess situations that can lead to severe accidents, such as loss of cooling water, loss of steam generator feedwater supply, or loss of power; demonstration through simulation of the Three Miles Island (TMI) and Fukushima accidents.

PROGRAM

The course focuses on lectures and practical work sessions on the SOFIA simulator. To perform analysis of thermal hydraulics during a reactor accident or safety assessment, the French technical safety organization IRSN uses the CATHARE (Code for Analysis of Thermal Hydraulics during an Accident of Reactor and Safety Evaluation) system code for PWR safety analysis, accident management and definition of plant operating procedures, and for research and development.

The module will cover the following subjects:

- PWR systems and normal reactor operation:
 - Introduction to PWR operation.
 - Main PWR systems.
 - General information and sequence leading to the hot shutdown state.
 - Description of the CATHARE thermal-hydraulic code.
 - Basics of core physics, divergence and core control.
 - Divergence and power increase turbine coupling.
- Design basis accidents for PWR:
 - Description of loss-of-coolant accidents (LOCA).
 - Large-break LOCA transient (LB LOCA).
 - Small-break LOCA transient (SB LOCA), fourth sequence: failure of first actions.
 - Description of steam generator tube rupture (SGTR accidents).
 - SGTR transient.
 - Sixth sequence: intervention strategy.
 - Seventh sequence: decision-making process for assault.
- Other PWR accidents:
 - TMI and Fukushima accidents.