

Simulator for Observation of Functioning during Incident and Accident - SOFIA

Session: to be determined 2018

Registration deadline: to be determined

Duration: 5 days

Certificates will be issued to participants who attend the full course.

Location: Paris, France

Price: € 4 900 for participants

The maximum number of students is limited to eight participants.

Code: 2018_CO1023

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Online catalog

www.enstti.eu/training-catalog

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 mastery of SOFIA simulator related for observation of functioning during incident and accident.

PUBLIC

This training is intended for engineers who wish to acquire general knowledge in functioning physics and safety of pressurized Water Reactors PWR in normal and accidental conditions.

PRE-REQUISITES

Participants should have some basic knowledge of PWR.

LEARNING OUTCOMES

Participants will be able to:

- to improve the understanding of physical phenomena that occurred on PWR during normal operation especially at the time of start-up stages, and also during accidental situations,
- to acquire a global view of the main systems of the nuclear island used in normal and accidental situations, and of their interactions,
- to understand the main step of the normal operation 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),
- to understand the main actions of the operation procedures as regards safety during accidental situations (LOCA, SGTR),
- to know and to assess the situations that can lead to severe accidents such as loss of cooling water, loss of steam generators feedwater or loss of power, and demonstration by reproduction of the accidents of Three Miles Island and Fukushima.

PROGRAM

The course is focused on lectures and practical work sessions on the SOFIA simulator. To perform analysis of Thermal-hydraulics during an accident of reactor or safety evaluation, IRSN, the French Technical Safety Organization, uses the Code for Analysis of Thermal-hydraulics during an Accident of Reactor and Safety Evaluation (CATHARE) which is a system code for PWR safety analysis, accident management, definition of plant operating procedures and for research and development.

The module will cover the following subjects:

- PWR Systems and Normal Reactor Operation:
 - Introduction of 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 Accident:
 - TMI and Fukushima Accidents.