



INSC Project MC.03/10

**Training and Tutoring for expert of the NRAs and their TSOs for
developing or strengthening their regulatory and technical
capabilities**

LOT 1

Tutoring Module N. 6 bis

**“Objective, requirements, methodology and
regulatory use of PSA”**

May 27 – July 19, 2013
c/o JSI and SNSA Ljubljana Slovenia

Tutoring Program
draft

April 2013

Tutoring Module

“Objective, requirements, methodology and regulatory use of PSA”

draft Program

The tutoring activity is conceived as “on the job training” at JSI and SNSA in the area of Probabilistic Safety Assessment for NPP including:

- PSA objective
- PSA structure
- PSA methodologies, models and key issues
- PSA data base
- Regulatory requirements for PSA
- Regulatory review of PSA
- Regulatory use of PSA

Objective of the tutoring will be to ensure an optimum of transfer of know-how and develop capability in understanding the objectives, the reference internal and external events, the requirements to perform and the regulatory use of the PSA.

The tutoring is made of one month at JSI devoted to technical, methodological, modelling and data base aspects and one month at SNSA devoted to use of PSA by the Regulator during licensing process, oversight of operation of a NPP and decision making.

During the tutoring activity the trainees will be asked to elaborate and report review analysis and prepare a final Tutoring report.

Programme at JSI

1st Week

Introduction:

- Introduce to both regulators R4, main work tasks,
- Introduce working place, documentation and equipment
- Present work plan, goals of work and final report

Review reliability input data:

- Types of data
- Sources of data (IEEE std. 500-1984, IAEA-TECDOC-478, IAEA-TECDOC-508)

- Extraction and analysis of input data for given set of components from provided databases: survey of ranges, distributions and their parameters

2nd Week

- Assessment of risk measures limiting values, their background and usage
- Reactor Safety Goal Policy Statement (US-NRC)
- WENRA Reactor Safety reference levels (EU)
- Others international practices

3rd Week

- Modeling and analysis of Large LOCA event tree for selected design from NUREG/CR-4550
- Review of the design and LLOCA event tree
- Introduction to Risk Spectrum software
- Creation of LLOCA event tree with empty functional events

4th Week

- Modeling and analysis of Large LOCA event tree for selected design from NUREG/CR-4550
- Creation of fault trees for functional events in LLOCA event tree
- Qualitative and quantitative analysis of LLOCA event tree, MCS identification, basic events importance measures

Programme at SNSA

1st Week

- Introduction of SNSA
- Licensing process, basic licensing principles,
- Regulatory requirements for licensing of nuclear facilities
- Safety Assessment and licensing decision (modifications and how to evaluate them, review of examples of some typical and some current modifications),
- License conditions and changes

2nd Week

- PSA information module at SNSA
- PSA for external events:
 - o Fire hazards
 - o Seismic hazards
 - o Flooding

- Review of PSA models
- Appropriateness of PSA for different application

3rd Week

- PSA for regulatory activities
- Participation to onsite inspections to insight into application of PSA in the NPP
- PSA in licensing modifications
- PSA to support on-line maintenance

4th Week

- Regulatory oversight of operation of NPP (inspection, enforcement) – PSA applications
- Use of PSA in for the safe operation of the NPP
- PSA Level 2 as the input for threat assessment
- Report writing about the topics covered in the SNSA