

# NUCLEAR TECHNOLOGY EDUCATION CONSORTIUM

**N14**

## **RISK MANAGEMENT**

### **Summary**

The module introduces the concepts of risk management by reference to nuclear and other systems. An introduction is given to the mathematical analysis of risk based on probability modelling, and extended to the case of quality modelling. A case study based on the Chernobyl accident is presented. Comparisons of risk management across industries are presented, including engineering contracting, rail transport, chemical process and pharmaceuticals as well as nuclear. A strong feature of the module is the inclusion of industrial practitioners able to talk from direct experience.

On completion, students should have obtained:

- A knowledge of systematic methods for identifying hazards
- An understanding of the mathematical concept of risk
- An appreciation of the techniques of probabilistic risk assessment
- Familiarity with examples of how such techniques may be used to understand and manage risk so as to satisfy the requirements of a regulator and of the general public.
- An appreciation of the new J-value technique for assessing health and safety expenditure.

### **Syllabus**

- Introduction to risk concepts; nuclear plant example
- Identification and understanding of hazards
- Logistic and probabilistic descriptions of risk
- Quantifying failure: FMEA, Event trees, Fault trees
- Comparing risks and setting disparate risks in context
- Risk management in large industrial companies
- Probability modelling using distributions. Chernobyl Case study
- Strategies for managing nuclear risk
- Culture, ethics and public tolerability
- Introduction to the J-value method for assessing health and safety spend, particularly for averting radiation dose.