N07 - NUCLEAR TECHNOLOGY EDUCATION CONSORTIUM NUCLEAR SAFETY
CASE DEVELOPMENT

Summary
The NTEC N07 Nuclear Safety Case Development module examines the fundamental
building blocks and the supporting processes and methodologies used in the formulation of a
'Modern standards nuclear safety case'.

Within the statutory framework that regulates the nuclear industry, there is an overriding
requirement to demonstrate through an adequate and appropriate safety case that all
hazards associated with operations on a Licensed Site are understood, effectively managed
and controlled. This Module introduces the knowledge and skills necessary to effectively
judge and influence the adequacy of licensees' nuclear safety cases.

On completion, students should:
• Understand the requirement for a modern standards nuclear safety case;
• Have an appreciation of the main building blocks of a modern standards nuclear
  safety case;
• Have an awareness of the main supporting processes and methodologies used
  in developing a modern standards nuclear safety case.

Syllabus: This module consists of pre-course reading, a series of lectures, an assessed
post-course assignment and an examination.

Pre-course reading:
• ONR Safety Assessment Principles for Nuclear Facilities
  http://www.onr.org.uk/saps/
• IAEA Nuclear Safety Tutorials
  http://www-ns.iaea.org/tutorials/bptc/intro/index.htm
• Guidance on application of ALARP
  http://www.onr.org.uk/operational/tech_asst_guides/index.htm

Topics:
• Legislative Requirements for a Nuclear Safety Case
• Purpose and Scope of a Nuclear Safety Case
• Nuclear Safety Justification Principles
• Safety Assessment Principles, Design Standards and Numerical Targets
• Safety Case Lifecycle
• Engineering Substantiation
• Deterministic Safety Justification
• Probabilistic Safety Analysis (PSA) Level 1
• Consequence Assessment (Level 2/3 PSA)
• As Low As Reasonably Practicable (ALARP)
• Safety Case Implementation, Operation, Maintenance and Review.

Subject areas also covered within the above topics also include; Safety Culture/Accidents, a
brief introduction to Human Reliability Analysis, examples of Fault Trees used in nuclear
reliability engineering, Safety Functional Requirements and Design Substantiation, HAZID
methods, and a detailed examination of what is understood by the term 'Risk'.

Post-course assignment
• Preparation of a Preliminary Safety Report for a nuclear facility using scenario data
  provided.