

Module Title Safety, Risk And Reliability Management	Reference EN4801 SCQF SCQF Level 10 SCQF Points 15 ECTS Points 7.5 Created May 2002 Approved March 2004 Amended August 2011 Version No. 3
Keywords Safety Critical Systems, ALARP, Risk Management, Reliability Assessment Techniques, Maintenance And Repair Policies, Management Of Ageing Plant.	

This Version is No Longer Current

The latest version of this module is available [here](#)

Prerequisites for Module

None.

Corequisite Modules

None.

Precluded Modules

None.

Aims of Module

To provide the student with the ability to understand risk and safety management, utilise techniques for system reliability assessment, and evaluate strategies for optimising plant availability.

Learning Outcomes for Module

On completion of this module,

Mode of Delivery

This is a lecture-based course supplemented with tutorials and student-centred learning.

Assessment Plan

	Learning Outcomes Assessed
Component 1	1,2,3,4
Component 2	1,2,3,4

Component 1 is a coursework which will be a risk and reliability assessment study, assessed by the submission of a report. (30% weighting)

Component 2 is an examination of 2.5 hour duration. (70%

students are expected to be able to:

1. Use techniques for specifying and assessing the safety integrity level of a given system.
2. Identify ways of ensuring safety conforms to the ALARP principle.
3. Identify and assess risk, and explain how risk can be managed.
4. Derive the reliability of a system and evaluate strategies for optimising plant availability.

Indicative Module Content

Causes and outcomes of industrial accidents. Role of design and management. Failure prediction and uncertainty of data. Safety life cycle. Hazard identification and control, HAZOP, Fault Tree and FMEA analysis. ALARP principle. Safety integrity levels, Human factors, Corporate responsibility, safety culture, management issues. Assessment techniques for system reliability. Design for reliability. Redundancy and standby systems. Maintenance and repair strategies.

Indicative Student Workload

	Full	Part
<i>Contact Hours</i>	Time	Time
Assessment	15	15
Lectures/Tutorials	36	36
<i>Directed Study</i>		
Directed Study	15	15

weighting)

Indicative Bibliography

1. LEITCH, R.D., 1995. Reliability Analysis for Engineers: An Introduction. Oxford: Open University Press.
2. O'CONNOR P.D.T., KLEYNER, A., 2012. Practical Reliability Engineering. 5th ed. Hoboken, NJ : Wiley
3. BIROLINI, A., 2017. Reliability Engineering: Theory and Practice. Berlin, Heidelberg: Springer Berlin / Heidelberg.
4. SMITH, D. J., SIMPSON, K. G. L., 2020. The Safety Critical Systems Handbook A Straightforward Guide to Functional Safety: IEC 61508 (2010 Edition), IEC 61511 (2016 Edition) and Related Guidance Including Machinery and Other Industrial Sections. 5th ed. London : Butterworth-Heinemann.
5. THOMSON, J. R., 2015. High integrity systems and safety management in hazardous industries. Oxford : Elsevier.
6. OSTROM, L. T., WILHELMSSEN, C. A., 2019. Risk Assessment: Tools, Techniques, and Their Applications. Newark: John Wiley & Sons, Incorporated.

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