eFunctionalSafety

ONLINE LEARNING PATH

Safety Instrumented Systems & Functional Safety for IEC 61511

This learning path is aimed at process industry managers, technicians, engineers and operations professionals, providing a solid understanding of functional safety and Safety Instrumented Systems in the process industry sector.

The ONLINE course has been peer-reviewed and independently accredited by the Institution of Chemical Engineers (IChemE) and was developed in line with international standard IEC 61511 edition 2, with cross-references to IEC 61508 edition 2 and other relevant industry guidance.

All learners get access to the course via our secure **INSIDER member platform** which tracks their course progress over modular periods of learning from work or home.

- **24/7 learning access**
- **Optional PDF course notes**
- **Narrated lessons**
- **Interactive quizzes**
- **IChemE Accredited Certificate of Completion & 18 CPD Hours**
- **Optional tutor Q&A sessions**

Testimonials

"Excellent course for operation, design and process engineering. Subjects well designed, organised and presented perfectly with practical examples."

- Krishnan J. - Process Engineer

"Good course, giving a clear understanding of SIS life cycle and IEC61511 requirements. Recommended to anyone working with SIS design and Functional Safety Assessment".

- Gil R. - Process Automation Leader

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Learning Outcomes

ELP003: SIS & Functional Safety for IEC 61511

At the end of this course, learners will be able to:

- Outline the IEC 61511 safety lifecycle from hazard and risk assessment through to final decommissioning
- Provide an overview of Functional Safety Management, assessment and audit requirements of IEC 61511
- Describe an SIS, and refer to the key standards and regulations which drive SIL requirements
- Follow a typical workflow of hazard and risk assessment, including explaining HAZOP, LOPA and how information from these studies can be used to determine SIL
- Work with probability and frequency for SIL studies
- Describe the importance and contents of Safety Requirements Specifications for effective SIS Validation
- Summarize SIS equipment selection options, including hardware and software types
- Outline the principles of SIS design, voting, hardware fault tolerance and SIL verification principles
- Explain the main operation and maintenance requirements of IEC 61511 for sustaining SIL
- Describe the documentation and key deliverables for IEC 61511 compliance

ELP003 - Detailed Contents

MODULE 1 - INTRODUCTION

- Author's message
- History of electrical devices & standards in safety applications
- The IEC 61511 SIS safety lifecycle
- Lessons from the Buncefield Storage Depot Accident, UK - 2005
- Assessment 1

MODULE 2 - TERMINOLOGY AND STANDARDS

- Key SIS terminology
- Regulations and standards
- IEC 61511 Edition 2 Update
- Assessment 2

MODULE 3 - MANAGEMENT AND PEOPLE

- Functional safety management overview
- Competence introduction
- Roles in the SIS safety lifecycle
- Verification and validation planning
- Functional safety assessment and audit
- Assessment 3

MODULE 4 - HAZARDS, RISK AND SIL

- Process industry hazards introduction
- Introduction to probability and frequency for SIL studies
- Hazard analysis workflow and methods
- LOPA Introduction
- Protection layer analysis and SIL determination
- SIS cyber security risk assessment introduction
- Assessment 4

MODULE 5 - SAFETY REQUIREMENTS

- SIS safety requirements specification
- SRS challenges
- Equipment selection
- SIS equipment failure
- Assessment 5

MODULE 6 - SIS DESIGN AND ENGINEERING

- Designing a SIF
- Safety PLC software
- Installation, commissioning and validation testing
- Assessment 6

MODULE 7 - OPERATIONS FUNCTIONAL SAFETY

- SIS operations
- Bypass and override
- SIS inspection and proof testing
- Modification & decommissioning
- Assessment 7
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