

Course Agenda

Functional Safety Engineer

for
Safety Instrumented Systems

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Module 1 – Introduction to Functional Safety

- 1.1 Accidents in the Process Industry Sector
- 1.2 International Safety Standards
- 1.3 Local Laws and Regulations
- 1.4 Basic Terms and Definitions

Module 2 – Functional Safety Management (FSM)

- 2.1 FSM Basics
- 2.2 Safety Life-Cycle and Safety Plan
- 2.3 Verification and Validation
- 2.4 Assessment and Audit
- 2.5 Independency
- 2.6 Modification
- 2.7 Documentation
- 2.8 Responsibilities & Competency

Module 3 – Hazard & Risk Assessment

- 3.1 Basic Terms and Definitions
- 3.2 Hazard Identification
- 3.3 Hazard Analysis
- 3.4 Risk Reduction

Module 4 – Safety Requirements Specification (SRS)

- 4.1 SRS Basics
- 4.2 SRS Content
- 4.3 SRS Review and Verification

Module 5 – SIS Hardware Design

- 5.1 SIS Design Objectives
- 5.2 Basic Terms and Definitions
- 5.3 Basic SIS Design – Hardware Concepts
- 5.4 Requirements for the Selection of Devices
- 5.5 Quantification of Random Failures – Reliability Analysis
- 5.6 SIL Verification

Module 6 – SIS Application Program (AP)

- 6.1 Basics
- 6.2 Application Program Safety Requirements Specification
- 6.3 Application Program Design
- 6.4 Application Program Implementation, Methods & Tools
- 6.5 Application Program Review and Testing
- 6.6 Application Program Safety Validation Planning
- 6.7 Application Program Modification

Module 7 – SIS Security

- 7.1 Basics
- 7.2 SIS Security – Design
- 7.3 Basic Cyber Security Principles by “Viega and McGraw”
- 7.4 Maintenance/Engineering Interface Security

Module 8 – Operation and Maintenance (O&M)

- 8.1 Objectives
- 8.2 Procedures
- 8.3 Training
- 8.4 Bypass and Maintenance Override
- 8.5 Repair and Spare Parts
- 8.6 Proof Test Execution
- 8.7 Proof Test Examples
- 8.8 Inspection
- 8.9 Maintenance

Module 9 – Local Laws and Regulations