

Course description

T142

Safety Instrumented Systems TÜV Rheinland Functional Safety Engineer

Course goal

The goal of this course is to learn the principles and requirements of Functional Safety according to IEC 61508 / IEC 61511. This includes the complete safety lifecycle in the context of Safety Instrumented Systems (SIS) projects.

Course attendance is open to all interested parties. Achieving the threshold mark for the examination and meeting the prerequisites as detailed below will result in the candidate becoming a certified TÜV Rheinland FS Engineer.

Learning objectives

Upon completion of this course, the participants will be able to:

- Describe the principles of Functional Safety Management and key features of IEC 61508 / IEC 61511
- Describe the requirements of the Safety Lifecycle
- Explain and determine Safety Integrity Levels (SIL) with different methods
- Outline the key deliverables from the Safety Lifecycle, roles and responsibilities
- Describe a Safety Requirement Specification
- Appreciate the need for Safety Lifecycle processes, procedures, methods and techniques
- Explain and determine key factors used in the SIS engineering and design such as Random Hardware Failure, Architectural Constraints and Systematic Capability
- Tell the main differences between IEC 61508 Edition 1 and Edition 2

Participant profile

This training is targeted to control, instrumentation and application engineers who will be involved in executing safety instrumented system projects covering any phase of the safety lifecycle from hazard and risk assessment, through engineering and design to operations and maintenance.

Prerequisites for TÜV Rheinland FS Engineer certificate

In accordance with the TÜV Rheinland Functional Safety program, to be accredited students shall have:

- A minimum of 3 years experience in the field of functional safety
- University degree or equivalent engineering experience and responsibilities as certified by employer or engineering institution



Topics

- TÜV Rheinland Functional Safety program
- Background on Functional Safety
- Regulations and Safety standards
- IEC 61508 and IEC 61511
- Management of Functional Safety
- Competency management
- Safety Lifecycle phases and planning
- Hazard and risk analysis
- Target SIL determination methods
- Safety requirement specification
- SIS design and development
- Probability calculation
- Selection of components, subsystems
- Proven in use - aspects
- Verification, validation, audit and assessment
- Operations, maintenance and modifications
- Continuous review and improvement

Course type and methods

This is an instructor led course with interactive classroom discussions and practical examples of implementation of safety systems.

Course duration

The duration is 4 days consisting of 3 days of tuition with an examination on the fourth day.

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Course outline

Day 1

- Course overview
 - TÜV Rheinland Functional Safety program
 - Background on Functional Safety
 - Regulations and safety standards
 - Safety lifecycle
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Day 2

- Management of Functional Safety
 - HazId and SIL determination
 - Safety Requirement Specification
 - SIS design and engineering
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Day 3

- SIS design and engineering
 - Verification and validation
 - Continuing use and improvement
 - IEC 61508 Edition 2
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Day 4

- Examination

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