Safety Lead Competency Centre
Technical Training Courses - Safety Instrumented Systems (SIS)

ABB's objectives are to ensure safety applications and supporting services are implemented in accordance with the IEC 61508/IEC 61511 standards.

This 'capability' which has been developed in the area of safety-related systems for over 35 years is required in order to meet the corporate process and functional safety management requirements of our customers.

Based on our extensive operational and technology 'know-how' the ABB Safety Lead Competency Centre (SLCC) provides a number of training courses to support our clients with their own competency development programs in the area of Safety Instrumented Systems (SIS) and Functional Safety Management. Delivery of our training content is undertaken by TÜV Rheinland certificated engineers and experts with proven experience within the management, specification, design, engineering, installation, operations, maintenance and modification of SIS.

How the SLCC can help our Customers

As part of our mandate to maintain accredited third party certification for ABB Design, Engineering, Operations & Maintenance Functional Safety Management System (FSMS) in accordance with the IEC 61508/11 standards, we provide functional safety related training services delivered to asset owners and safety supply chain organisations. This expertise is provided to assist these organisations in achieving Functional Safety Lifecycle compliance.

Training Course Details

The ABB SLCC provides client-orientated technical training in the following topic areas:

T140 - Design & Engineering Functional Safety Principles and Implementation Rules (One Day)

This course provides attendees with an understanding of the principles of Functional Safety Management, the safety lifecycle and how to implement the safety lifecycle in the context of safety-related systems projects and safety applications.

Upon completion of this course, delegates will be able to:
- Describe the principles of functional safety management and key features of related standards
- Describe the requirements of the safety lifecycle in the context of a safety systems integrator
- Understand the key deliverables from the safety lifecycle and explain System Integrity Levels (SIL)
- Explain the need for and use of safety lifecycle processes, procedures, methods and techniques

T141 - Functional Safety and Achieved SIL Assessment (One Day)

The goal of this course is to build on the principles of Functional Safety Management as found in the supporting SLCC course 'T140' focusing on the implementation of the safety lifecycle in the context of safety-related systems projects and safety applications. This course provides additional detail and understanding for the requirements of 'Achieved SIL' in the context of meeting architectural constraints, failure rate measures and systematic capability for safety related design solutions.

Upon completion of this course, delegates will be able to:
- Identify the key data requirements for developing a solution that meets the Target SIL as defined in the earlier safety requirements specification (SRS)
- Present a worked example for Achieved SIL assessment

T142 – TÜV Rheinland Accredited FS Engineer Certified Training (Four Days)

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 course examination and meeting the pre-requisites as detailed below will result in the candidate becoming a certificated TÜV Rheinland FS Engineer. 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

T145 – IEC 61511 Functional Safety Appreciation and Awareness Training Course

The goal of this course is to provide an End User/ EPC perspective of the key management, design and operational requirements of Functional Safety according to IEC 61508/ IEC 61511.This includes the key steps to compliance in the context of Safety Instrumented Systems (SIS) projects. Upon completion of this course, the participants will be able to:

- Describe the principles of Functional Safety and key features of IEC 61508/IEC 61511
- Describe the requirements of the Safety Lifecycle
- Appreciate the methods available to determine Safety Integrity Levels (SIL)
- Appreciate the need for Safety Lifecycle processes, procedures, methods and techniques
- Understand the key factors used in the SIS engineering and design such as Random Hardware Failure, Architectural Constraints and Systematic Capability
- Requirements for operations, maintenance & modification

T146e – FMEA Analysis in the Context of IEC 61508 Requirements (E-learning Modules)

This is a modularised e-learning training course that allows delegates to develop a general appreciation and awareness of FMEA analysis techniques and methods in the context of IEC 61508 and in support of their own device assessment requirements within the workplace. The course comprises 8 modules that are required to be undertaken with an examination included at the end of each module to test understanding and to provide a pass rate for the student to progress to the next module in sequence.

On completion of this course delegates will be able to:

- Understand the importance and relevance of FMEA in the context of designing and engineering of safety systems compliant with IEC 61508
- Understand the processes, inputs and outputs required to undertake an FMEA study in the context of device integration
- Have a clear understanding of the terms and definitions specific to FMEA and how these align to those of IEC 61508

Once completed, the student will receive a general level 1 awareness and understanding certificate. An extension to this training enables candidates who want a deeper level of knowledgeto take an FMEA case study assignment. The assignment involves successfully completing a detailed and worked examples with mentored assessment leading to a level 2 certificate.

T147 – Developing a Compliant Safety Requirements Specification

The goal of this course is to build on the principles of Functional Safety Management focusing on the derivation of the Asset Owner Safety Requirements Specification for the successful design and engineering of SIS projects and safety applications. This course provides additional detail and understanding for the requirements of Safety Requirements Specification development in the context of meeting the functional design requirements of IEC 61511. Upon completion of this course, delegates will be able to:

- Understand how the information available to develop safety requirements is derived and transposed into functional design requirements
- Identify the key data requirements for developing a compliant SRS in accordance with IEC 61511

T148 - End User Appreciation & Awareness in Functional Safety Assessment (FSA)

The goal of this course is to understand the principles of functional safety assessment (FSA) from the End Users perspective, and how to manage the requirements in the context of the safety life cycle & related projects and systems. This training is targeted to personnel who will be involved in assessing the functional safety of safety systems, processes and projects. Upon completion of this course, Delegates will be able to:

– Understand the requirements for independent functional safety assessments as defined in IEC 61508/61511
– Appreciate the principles of functional safety management and the key features of lifecycle planning, safety auditing and safety assessment
– Describe the requirements and differences between the safety lifecycle requirements for 'Safety Audits' and 'Functional Safety Assessments'
– Understand the key processes, expectations, independence and deliverables for the specific scope of a functional safety assessment mapped to specific phases of the safety lifecycle

T149 - End User SIS Design, Engineering and Supply Chain Requirements

The goal of this course is to understand the principles of functional safety management from the End Users perspective, and how to manage the design and engineering lifecycle phases in the context of safety-related systems projects and safety applications. It is targeted to personnel who will be involved in executing safety system application projects. Upon completion of this course, Delegates will be able to:

– Appreciate the principles of functional safety management and the key features of related standards from the End Users perspective
– Describe the requirements of the design and engineering safety lifecycle phases in the context of the End User
– Understand the key deliverables from the safety lifecycle design and engineering processes and the expectations from the supply chain
– Understand the need for and use of safety lifecycle processes, procedures, methods and techniques for SIS design and engineering in compliance with IEC 61508/IEC 61511

T152 – TÜV Rheinland Accredited FS Technician Certified Training (Three Days)

The goal of this course is to learn the principles and requirements for proper operation and maintenance of SIS according to IEC 61508/ IEC 61511.

Course attendance is open to all interested parties. Achieving the threshold mark for the course examination will result in the candidate becoming a certificated TÜV Rheinland FS Technician. Upon completion of this course, the participants will be able to:

– Describe the principles of Functional Safety Management and the key features of IEC 61508 / IEC 61511
– Describe the requirements of the Safety Lifecycle
– Outline the key deliverables from the operations & maintenance safety lifecycle phase, roles and responsibilities
– Explain the key factors used within the SIS engineering and design phase such as random hardware failure, architectural constraints and systematic capability
– Understand the requirements for proper inspection, operation and maintenance of installed SIS as required by the safety standards

Benefits of Engagement with the SLCC

The ABB SLCC provides functional safety services which are truly independent from the client's management, technical organisation and activities and meet the "Independence" requirements stated within IEC 61508 Ed2: Part 1, clause 8.2.15. Our resources have TÜV Rheinland FS Expert and TÜV Rheinland FS Engineer recognised certification and are represented on a number of Industry Safety Bodies/ Institutions. SLCC resources can also claim many years Asset Owner and Systems Integration Experience on a number of Technology Platforms. Our solutions are proven to deliver technical robustness, operational excellence and sustainable business improvement.

For more details on the courses above and how to order:

Please contact the Safety Lead Competency Centre below for attendance at any Open course being planned in your region or if you would like to run a training course specific to your organisation, a fixed price training proposal will be issued for your review and approval.

Assured & certified products, services, delivery & execution. For further information please contact:

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