

CTAI Academy

“TÜV Rheinland Functional Safety Program – Safety Instrumented Systems – Course and examination qualification – Standards IEC 61511 / IEC 61508”

CTAI S.r.l. is a recognised “Course Provider” by TÜV Rheinland GmbH for courses in the "TÜV Rheinland Functional Safety Program”.

The duration of the course is four days and a half: during the first three days, we present the topics, through the support of examples and practical cases, in order to understand and deepen the requirements of standards IEC 61511 and IEC 61508. The fourth day there will be a tutorial, where participants have the possibility to apply the basics illustrated in the previous three days. On the last day, participants are invited to take an examination and, in order to pass it, they must achieve a minimum score of 75%.

Participants who pass the examination and have appropriate education and experience will receive the FS Engineer (TÜV Rheinland) certificate. The certificate is valid for 5 years, thereafter it is renewed upon evidence of continuity of experience in functional safety.

The course is held in Italian by Eng. Carlo Tarantola, recognised FS Expert (TÜV Rheinland), with extensive knowledge of the subject and more than 15 years experience in the field.

TARGETS

- to understand the key requirements of standards concerning functional safety
- to apply a correct management of the functional safety in the company
- to implement risk analysis; to classify SIL for safety instrumented systems
- to define the safety requirements specifications
- to define design of safety instrumented systems taking into account the system architecture limits, the diagnostics, the test intervals among functional tests
- to verify and validate safety instrumented systems
- to use safety instrumented systems according to safety manuals
- to use third party reports and certifications

Duration

3 training days, 1 day for tutorial, 4 hours for the examination

Addressees

Technicians, designers, quality manager, everyone is concerned in any phase of the safety lifecycle of SIS (Safety Instrumented Systems)

Training material

Course lectures and certificate of attendance
FS Engineer (TÜV Rheinland) certificate – upon successful completion of the examination and appropriate education and experience

Scheduling

The course is held regularly, usually in February, May and September/October of each year, as reported in the "News" section of our website. It can also be arranged at client's premises, applying a "lump sum" rate.



CTAI S.r.l.

Cod. Fisc. / P. IVA 05945400967
Capitale Sociale 10.000,00 € i.v.

Sede Legale

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CONTENTS

First day:

- Introduction to functional safety
 - What is the functional safety
 - What is a safety instrumented system
 - Legislative requirements
 - Main requirements of standards IEC 61511/61508
- Functional safety relevant parameters
 - Systematic Capability and Systematic Integrity
 - Failure rates, common cause failures
 - Diagnostic coverage
 - Architectural constraints
 - PFD/PFH
- Managements of functional safety
 - Functional Safety Management System and Safety Lifecycle
 - Safety plan
 - Management of the documentation
 - Responsibilities and competence
 - Independence level
 - Functional safety assessment

Second day:

- Risk analysis and SIL allocation
 - ALARP and tolerable risk
 - Hazard and risk analysis
 - Protection levels
 - Safety functions allocation
 - Methods for SIL allocation
 - Risk graph
 - Layer of Protection Analysis (LOPA)
- Design of safety instrumented systems and devices used in them
 - Safety requirements specification
 - Realisation of safety systems
 - General regulations of SIS design
 - System architecture
 - Diagnostic methods
 - Behaviour upon failure detection
 - Techniques and measures to control/avoid HW systematic failures
 - Selection of the devices to be used in the SIS

Third day:

- Estimation of random failures and PFD_{AVG} / PFH
 - Random failures estimation
 - FMEA
 - Field feedback
 - PFD_{AVG} / PFH estimation for different architectures
 - Reliability block diagrams
 - Markov models
- Realisation of software for safety applications
 - Requirements for embedded and application SW
 - Software life cycle
 - SW safety requirements specification
 - SW development
 - SW validation
 - Techniques and measures to control/avoid SW systematic failures
- Use of safety instrumented systems
 - Installation and commissioning
 - Validation
 - Operation, maintenance and repair
 - Management of modifications
 - Safety manual

During the three training days we provide various exercises and examples (>40) concerning the different topics.

Fourth day:

- Tutorial on the design of a safety instrumented system



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