Competency development
The process industries are continually seeking ways to improve the safety lifecycle, knowledge and practices of responsible persons who are involved with the assessment, specification, design and operation of safety instrumented systems (SIS).

Course goal
This industry recognised ‘certificated’ training course is geared to present the principles and requirements of functional safety according to IEC 61508 / IEC 61511. This includes the complete safety lifecycle in the context of 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 should 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 (SRS)
- 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

Participant profile
This training is targeted to control, instrumentation and application engineers who are 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 FS Engineer Certificate
In accordance with the TÜV Rheinland Functional Safety program, to be accredited for attendance students shall have:
- A minimum of three 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 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 four days, consisting of three days of tuition with an examination on the fourth day.
Course outline

Day 1

- Course overview
- TÜV Functional Safety program
- Background on functional safety
- Regulations and safety standards
- Safety lifecycle

Day 2

- Management of functional safety
- Hazard and SIL determination
- Safety Requirement Specification (SRS)
- SIS design and engineering

Day 3

- SIS design and engineering
- Verification and validation
- Continuing use and improvement

Day 4

- Examination

'Open' course schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 26-29, 2015</td>
<td>Oslo (Norway)</td>
<td>Henrik Skovsgaard</td>
</tr>
<tr>
<td>March 17-20, 2015</td>
<td>Teesside (UK)</td>
<td>Dr Alan King</td>
</tr>
<tr>
<td>April 14-17, 2015</td>
<td>Odense (Denmark)</td>
<td>Henrik Skovsgaard</td>
</tr>
<tr>
<td>April 21-24, 2015</td>
<td>Minden (Germany)</td>
<td>Dr Alan King</td>
</tr>
<tr>
<td>September 22-25, 2015</td>
<td>Minden (Germany)</td>
<td>Dr Alan King</td>
</tr>
<tr>
<td>September/October 29-02, 2015</td>
<td>Odense (Denmark)</td>
<td>Henrik Skovsgaard</td>
</tr>
<tr>
<td>November 03-06, 2015</td>
<td>Singapore</td>
<td>Henrik Skovsgaard</td>
</tr>
</tbody>
</table>

Further course dates are shortly to be confirmed for:
- US/Canada
- Abu Dhabi

Client specific ‘site-based’ training

ABB are pleased to provide specific customer ‘site-based’ training courses where it is more appropriate in terms of cost efficiency and logistics for a number of engineers to be trained at your company premises. If you would like to run a training course specific to your organisation, then please do not hesitate to call the ABB contacts below.

On completion of the appropriate follow-up discussions, a fixed price training proposal will be issued to you for your approval to proceed and the training delivered to meet your specific on-site requirements.

How to order

For the 2015 open course schedule, please register via ABB University’s web site: [http://www.abb.com/AbbUniversity/Courses.aspx?key=T142&country=all](http://www.abb.com/AbbUniversity/Courses.aspx?key=T142&country=all). Select upcoming classes or use the keywords section to find the Expert Workshop you want to register for.

Call directly the ABB contacts below who can provide further information for site-based training courses.

**Volker Albert**
Minden, Germany
Phone: +49 571 830 1989
volker.albert@de.abb.com

**John Walkington**
St Neots, UK
Phone: +44 (0)1480 475321
John.walkington@gb.abb.com

On completion of the appropriate follow-up discussions, a fixed price training proposal will be issued to you for your approval to proceed and the training delivered to meet your specific on-site requirements.