DE0104 Functional safety of E/E/PE safety related systems according to IEC61508

Training:

- Section 1 (2 days): Development of safety related Systems and Hardware acc. to IEC 61508 (DE0102)
- Section 2 (2 days): Development of safety related Software, Analysis & Testing acc. to IEC 61508 (DE0103)

Who should attend?

- Development Engineers (System, Hardware, Software)
- Safety Managers
- Hardware/Software Project Leaders
- Hardware/Software Quality Responsible

Duration:	4 days (or in-house, jointly agreed, please contact us for more information)
Language:	Depending on the participants the training will be given in German or English. The training material will be in English.
Location:	*exida.com* GmbH office Prof.-Messerschmitt-Straße 1 85579 Neubiberg / Germany
Certificate:	Each participant gets a letter of attendance.
Participants:	Suggestion max. 12 per training

For more information, please contact:
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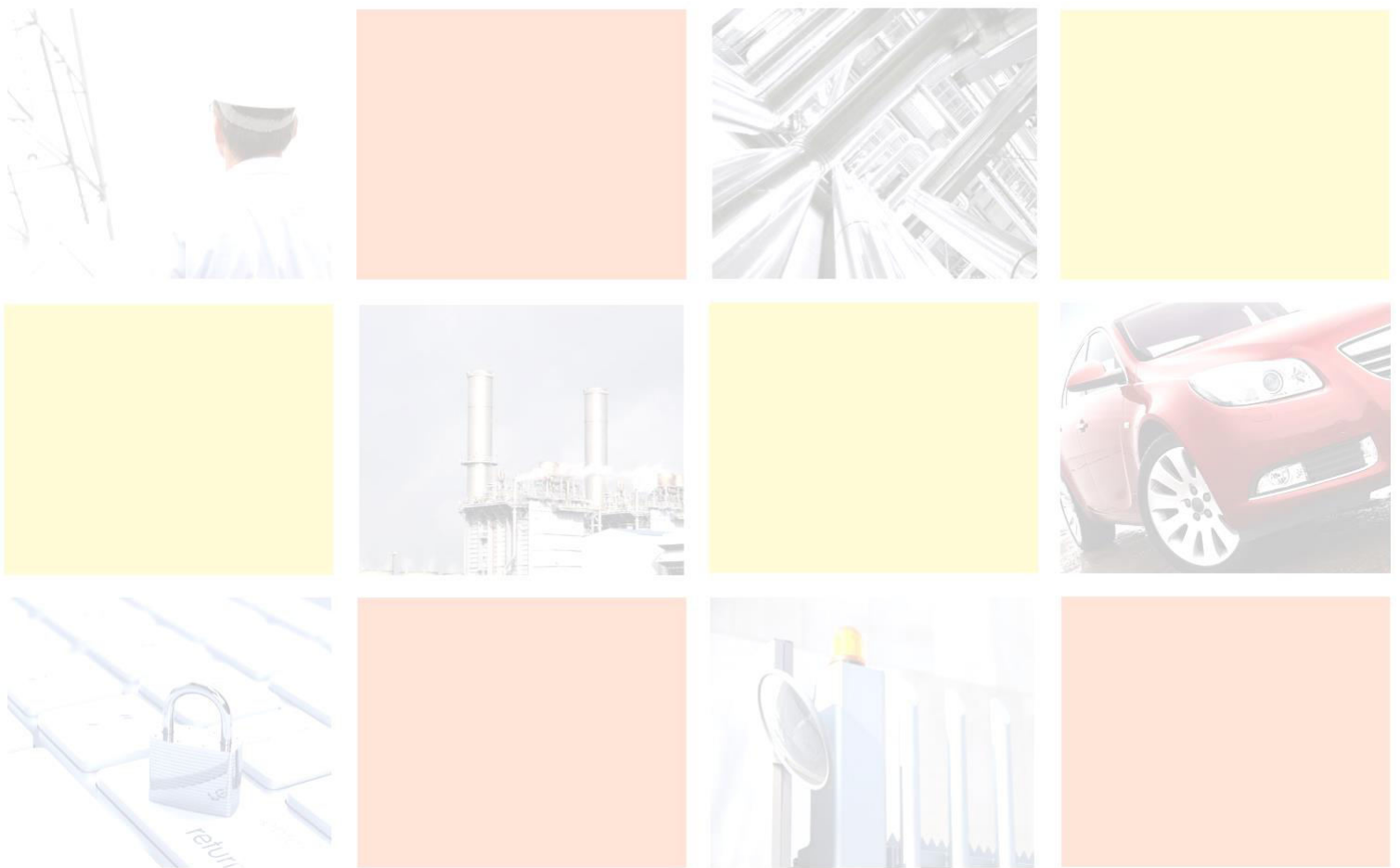# DE0104 Functional safety of E/E/PE safety related systems according to IEC61508

Agenda and Content of Section 1 (IEC 61508 HW):

- Functional Safety in general and relevant standards
- The Safety Lifecycle according to IEC 61508
- What is required to achieve a certain Safety Integrity Level (SIL)?
  - $SIL_{PFD/PFH}$
  - SIL_{AC} – Route 1H versus 2H
  - SIL_{SC}
  - High demand mode versus low demand mode
- FMEDA Details
- Introduction to the Methodology
  - FMEA/FMEDA – Procedure
  - Terms and Definitions
  - Source of failure rates, failure modes and failure distributions
  - Objectives of Hardware Metrics
  - Soft errors / transient faults
  - FMEDA – Example
- De-rating
- Common Cause Failures
- Fault Insertion Testing
- Why Functional Safety also for mechanical parts?
  - Mechanical parts according to IEC 61508 / ISO 13849-1
  - Short overview of Draft prEN 17955 - Industrial valves - Functional safety of safety-related valves and actuators
- Elements in the context of an entire safety function
  - Impact of proof testing
  - Proof Test Coverage (PTC)
- IEC 61508 3rd Edition

Content of Section 2 (IEC 61508 SW):

- Development of Software with Functional Safety, Verification & Testing techniques according to IEC 61508

- Addressing the process requirements and the required tool set from the IEC 61508 tables.

- System-level (item verification) and hardware/software interface related issues are mentioned on a summarizing level to provide a comprehensive understanding of Functional Safety Management of the Software.

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Agenda of Section 2 (IEC 61508 SW):

- From concept to system decomposition:
  - What software people have to know about system and hardware decisions
- Software Development (IEC 61508 - Part 3)
  - Content of the SW Safety Process
- SW Safety Specification and requirements allocation
- SW Architecture: How to do it, how to use it
- SW related methods, measures and techniques
  - How to deal with the tables in the IEC 61508
  - exemplification: Software planning using an UML tool (Enterprise Architect)
- Partitioning, protection of interference freeness,
  - runtime measures for detecting residual errors in software
  - exemplification: typical solutions
- SW Safety Verification
  - Requirements on Verification
  - SW Analysis Techniques
    - SW Criticality Analysis
    - SW Dependent Failure Analysis
  - SW Testing Techniques
    - Requirements based (Equivalence Classes, Boundary Values, etc.)
    - Structure based (Statement Coverage, MCDC, Call Coverage, etc.)
  - Examples and Exercises with example solutions
- Tool qualification

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