Analyze and improve automotive safety architectures and requirements

Train to become an advanced systems, hardware or software safety analyst

Training on safety analysis methods and best practices to meet ISO 26262 requirements

This two-day advanced training for automotive safety analysis of failure modes and effects analysis (FMEA), failure modes and effects diagnostics analysis (FMEDA), and fault tree analysis (FTA) will address the requirements of ISO 26262:2018, the standard for road vehicles — functional safety, with detailed examples from Parts 4, 5 and 6.

The course begins with an introduction to FMEA basics, moving onto unique requirements for safety FMEA and how the FMEA for functional safety concept (FSC) and technical safety concept (TSC) are developed. The training focuses on ISO 26262, Parts 4, 5 and 6, with specific experience-based guidance on performing effective software safety analyses, including FMEA and dependent failure analysis (DFA).

Several core concepts include qualitative versus quantitative analysis of the FMEDA, failures in time (FIT) rate calculations and catalogs, and calculating the ISO 26262 hardware random failure metrics with FMEDA. The second day of the training touches on FTA basics with detailed guidance on the similarities and differences between the FMEA and FTA integration metrics for safety validation.

This training also includes a discussion of the best practices and requirements from ISO 26262:2018-8, Clause 9-Verification, and ISO 26262:2018-9, Clause 7-Analysis of Dependent Failures and Clause 8-Safety Analyses.

Training topics

Day 1

- Brief ISO 26262 recap
- FMEA basics
- Failure modes, effects and causes
- Unique requirements for safety FMEA
- FMEA for FSC and TSC development
- Software safety analysis using FMEA
- Quantitative versus qualitative analysis
- FMEDA basics
- FIT rate calculation and catalogs
- Diagnostic coverage (DC)
- Calculating ISO 26262 metrics with FMEDA, including probabilistic metric for random hardware failure (PMHF), single point fault metric (SPFM) and latent fault metric (LFM)

Day 2

- FTA basics
- Functional FTA for functional safety requirements (FSRs)
- Probability calculations in FTA
- Hardware FTA
- Calculating ISO 26262 metrics with FTA, including PMHF
- Similarities and differences between FMEDA and FTA
- Confidence levels
- Fault detection, mitigation and control
- Multi-point fault detection interval (MPFDI)
- Integrating metrics for safety validation
- Vehicle-level integration of supplier safety analysis

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Drive complete safety requirements and safer automotive product architectures

Objectives

Upon successful completion of this training workshop, you will be able to:

- Summarize the similarities and differences between FMEDA and FTA
- Perform comprehensive software safety analysis
- Analyze confidence levels for failure rate data
- Understand advanced topics in fault detection, mitigation and control
- Become familiar with the multi-point fault detection interval and how it's used
- Integrate the metrics for safety validation within your team's framework
- Document the vehicle-level integration of supplier safety analysis

Target audience

You will benefit from this training if you are a:

- Systems, hardware and software engineer
- Verification and validation engineer
- Safety manager
- Engineering manager

Why choose kVA by UL?

Our team's expansive knowledge of the automotive product development life cycle sets us apart in the functional safety industry. From hazard analysis to functional design and validation target-setting, the engineers at kVA by UL understand safety for complex electronic systems.

Expert trainers – kVA by UL's trainings provide an in-depth overview of the methodologies used in the ISO 26262 and ISO/PAS 21448 standards. Our trainers are experienced automotive engineers who have designed and validated real-world automotive systems at major automotive companies worldwide.

Advisory support – Our services span across autonomous vehicles, connectivity of electronic modules and infotainment, semiconductors, cybersecurity and robotics.

For more information, call 1.864.630.5373, email: kvasales@UL.com or visit kvausa.com.

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