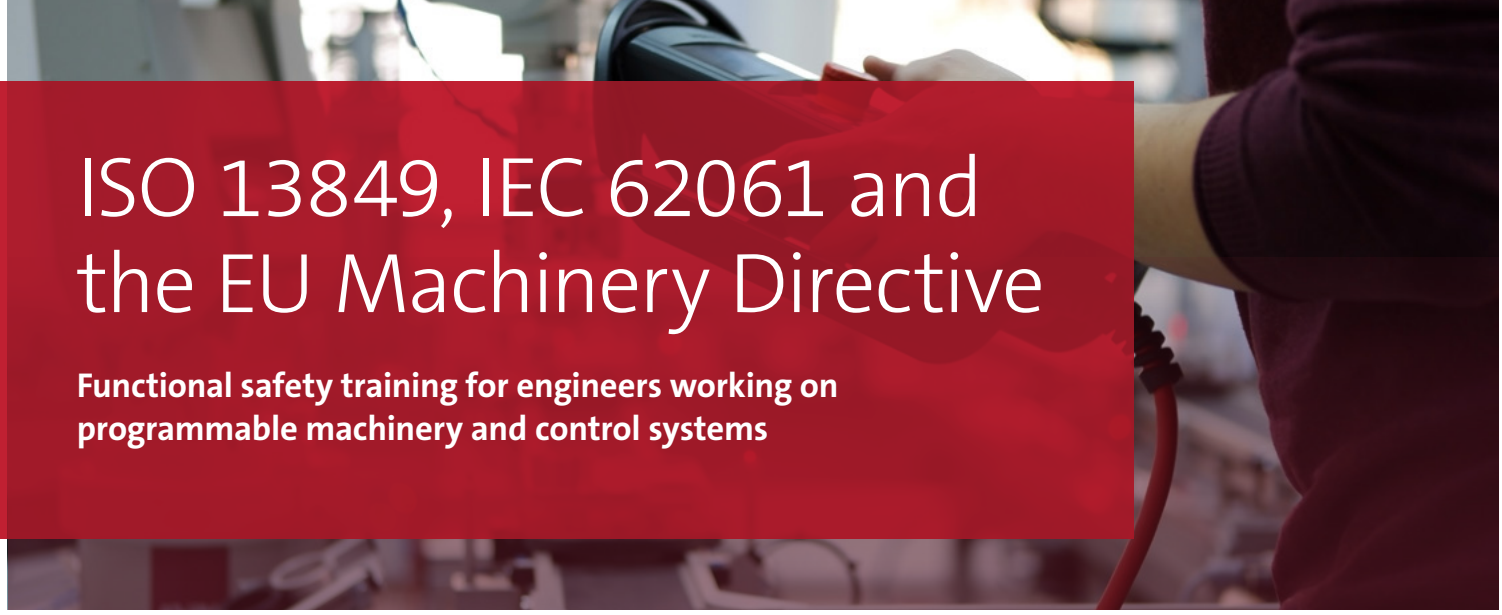

ISO 13849, IEC 62061 and the EU Machinery Directive

Functional safety training for engineers working on programmable machinery and control systems

Course overview

This 2.5-day technical training course will cover functional safety standards and concepts related to the EU Machinery Directive, such as ISO 13849, Safety of Machinery — Safety-Related Parts of Control Systems, and IEC 62061, Safety of Machinery — Functional Safety of Safety-Related Electrical, Electronic, and Programmable Electronic Control Systems. In addition, other topics such as hazard identification and risk assessment in accordance with ISO 12100 will be covered. Case studies on a range of topics, including motor drives with their certification per IEC 61800-5-2 and safety product life cycles, will also be used to provide examples of how the requirements and concepts of the standards are applied. The value of IEC CB Scheme test reports for Global Market Access is explained.

Training topics

- Role of EN ISO 13849 and IEC/EN 62061 in machine safety regulations
  - EU Machinery Directive
- Comparative overview of EN ISO 13849 and IEC/EN 62061
- Hazard identification and risk assessment according to the ISO 12100 standard
- Design in accordance with ISO 13849
  - Risk reduction and required performance level
  - Determination of required performance level
  - Parameters of performance level
  - Mean time to dangerous failure (MTTF), diagnostic coverage (DC)
  - Measures to avoid common cause failures (CCF)
  - Failures to be considered and fault exclusion
  - Introduction of quantitative analysis techniques
  - Evaluation of performance level (simplified procedure)
  - Software safety requirements
  - Software-based parameterization
  - Combination of SRP/CS to achieve PL
- Design in accordance with IEC 62061 (considering overlaps with ISO 13849)
  - SIL assignment
  - Specification of requirements for SRCFs
  - Functional decomposition
  - Realization of subsystems
  - Determination of the safety performance of the subsystem
  - Basic estimation of PFHD of subsystems
  - Contribution of common cause failure (CCF)
- The future of IEC 62061 and ISO 13849
- Identify the required risk reduction and functional safety ratings (PL and SIL) to be provided by control systems
- Develop a safety concept that satisfies the requirements of both ISO 13849 and IEC 62061
- Apply the steps required by both ISO 13849 and IEC 62061 to achieve the required risk reduction and validate it
- Overview on the requirements of IEC 61800-5-2 for motor drives to simplify machinery safety concepts and the Global Market Access options of the IEC-EE CB Scheme

Optional UL Certified Functional Safety Professional Exam

Participants who complete all 2.5-days of training are eligible to take a two-hour certification exam in the afternoon of the third day. Those who pass the exam are individually certified as a *UL Certified Functional Safety Professional* in Machinery, or *UL-CFSP*.

Upon the successful completion of the *UL-CFSP* exam, participants will receive a certificate and badge that they can use to demonstrate their competence in machinery functional safety. The certification is good for three years, after which individuals may recertify.

Objectives

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

- Identify the required risk reduction and functional safety ratings (PL and SIL) to be provided by control systems.
- Develop a safety concept that satisfies the requirements of both ISO 13849 and IEC 62061. Know how to use the Safety Functions defined in IEC 61800-5-2 when integrating motor drives.
- Apply the steps required by both ISO 13849 and IEC 62061 to achieve the required risk reduction and validate it.

Target audience

- Hardware/firmware designers
- Development managers
- Project and product leaders
- Compliance engineers
- Design and manufacturing engineers

Why choose UL?

From materials testing to supply chain management, new energy options to security and interoperability solutions, leverage our expertise and insights to navigate the global regulatory landscape and bring your products to market.

UL's global network of technical experts and state-of-the-art facilities, along with our longstanding relationships with regulatory authorities, partner laboratories and industry technical leaders, helps manufacturers gain the compliance credentials they need to compete in a more complex global supply chain.

Knowledge you can trust – Our experienced staff will support you from the initial design stage of product development through testing and production. Our experts can assist you in understanding the certification requirements for your specific markets.

Speed and efficiency – Our cost-effective systems and state-of-the-art facilities cut through the red tape and help accelerate your time to market.

Single-source provider – UL meets all of your compliance needs and, by bundling safety, performance and interoperability services, also helps save you valuable time and money.

Global reach and access – Our global network of expert engineers helps you understand the various national and global requirements for your specific market application.

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

Empowering Trust®

258.01.0721.EN.EPT