ISO 13849-1: Safety-Related Parts of Control Systems (SRP/CS)

Official Portal

https://www.iso.org/standard/80449.html

1. Scope & Purpose

ISO 13849-1 provides safety requirements and guidance on the principles for the design and integration of safety-related parts of control systems (SRP/CS), including the design of software.

2. Performance Levels (PL a to PL e)

Safety functions are classified into Performance Levels from PL a (lowest) to PL e (highest) based on risk reduction requirements. Achieving PL d or PL e typically requires redundant hardware channels (Category 3 or Category 4) and high diagnostic coverage.

3. Hardware vs. Software Architecture

Under ISO 13849-1, safety-related software (SRESW / SRASW) must be verified independently of the developer for higher PLs, and software alone cannot substitute for physical hardware interlocks in Category 3/4 architectures.

4. Presumption of Conformity

When harmonized as EN ISO 13849-1 under the EU Machinery Directive / Regulation, compliance grants a legal presumption of conformity for control system safety.