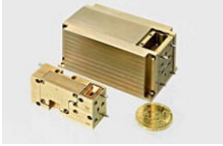


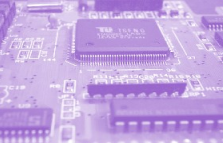
# AL Safety Design

## Reliability and Risk Management



### Consultant Services for Design and Delivery Projects

- 3rd Party Independent Risk Analyses, compliance
- Reliability Engineering and Risk Management in design projects
- Functional Safety, Reliability and Availability Analyses
- Support for Product Certification and Documentation



### Functional Safety - EN 61508

Functional Safety analysis/ compliance: MTBF, SIL-prediction for electronic systems and machines. Safety compliance, FS-documents, certification support (EN 61508, EN 62061, EN 13849). Planning for Accelerated Tests. Manufacturing/assembly risks.



### Process, Power and Chemical Plants

HAZOP-SIL-LOPA: Process risk analysis, Safety Integrity Level, Layers of Protection, Residual risks. Safety Management Plans, Inherently Safe Design, Safety improvements. RAM-analysis, Maintenance costs, LCC.



### Renewable Energy: Wind, Solar, Fuel Cells, Bio Fuel

Process Hazard Analysis: Hazop, PPA, SIL, LOPA. Risk analysis of Control Systems. RAM-Analysis of systems. Maintainability Analysis, maintenance costs. Design-FMEA: product risks, Process FMEA: assembly/ manufacturing risks.



### Machine Systems, Railways

Risk analysis of Control Systems. Functional Safety, compliance: EN 61508/ 61511, EN 62061, EN 13849, EN 50126. Availability and RAM analysis, Life Cycle Cost.



### Medical Systems, Instruments

Risk analysis, Risk Management Plans in product development. CE-compliance. Safety Compliance: EN ISO 14971 - Risk Management. Reliability Plans. MTBF-prediction, Failure analysis of Systems. FMEDA Analysis. Manufacturing risks.



### Ships, Maritime Systems, Equipment

Risk Analysis. Functional failure analysis of ship systems. Redundancy analysis for propulsion, safe return to port. Manufacturing/ assembly risks.



### High Reliability Systems - Space, Aviation

Product Assurance (PA) Management according to ESA standards. PA-Plans, Risk Management Plans. Configuration control, Non-Conformance control systems. Manufacturing risks. Failure analysis of Systems.

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Webinars - [www.reliabilityacademy.fi](http://www.reliabilityacademy.fi)

1. Reliability Engineering Basics
2. Risk Analysis Basics
3. FMEA - Failure Modes and Effects Analysis
4. Functional Safety (EN 61508) workshop
5. Reliability of Electronics - failure rate calculations
6. Accelerated Tests

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