

# AL Safety Design

## HAZOP - SIL - LOPA

### AL Safety Design Ltd

is an independent consulting firm, which was founded and started its operation in 1991.

The services include:

- Reliability,
- Safety,
- Product Assurance and
- Conformance Engineering

Our main office is in Helsinki (Espoo), Finland. The company is privately owned by its employees.

Our international customers include major companies in energy technology, chemical industry, aerospace and electro-technical industry.

The assignments are carried out according to the latest Reliability, Safety, Quality and Environmental standards.

**We enable our customers to develop superb technology products**

**AL Safety Design Ltd.**

**P.O.B. 75  
FI-02701 KAUNIAINEN  
Finland**

**tel : +358-9-884 3066  
+358-400-800 022**

**Email: info @ alsafety.com**

**WWW.ALSAFETY.COM**



## Risk Analysis in Process Industry

AL Safety Design uniquely combine the Hazop, SIL and LOPA methods by using our efficient Hazop tool. This allows for determining quickly the generally acceptable levels of risks identified by the Hazop analysis.

### • HAZOP - Hazard and Operability Study

- Most widely used Risk Identification method in chemical and power industries.
- HAZOP is used as an effective support and checking tool for system designers.
- Harmful consequences of typical process deviations are analyzed
- HAZOP Report contains a comprehensive list of process improvements

### • SIL - Safety Integrity Level

- SIL parameters are defined for each risk identified in HAZOP
- SIL classification describes the magnitude of risk, as in EN 61508, EN 61511.

### • LOPA - Layer of Protection Analysis

- LOPA method studies the severity of protection failures as described in EN 61511
- The probability of protection failure is combined with incident probability, giving the probability of a catastrophic event with the designed configuration.

**Training Courses:** [www.reliabilityacademy.fi](http://www.reliabilityacademy.fi)

*Our customers: ABB, Wartsila, Valmet, St1 Biofuels, Cargotec, MacGregor, Metso, Sandvik, Kone Corp, Neste Oil, STX Europe, Outotec, SWECO, Pöyry Plc etc.*

**AL Safety Design**

