

# PROACT with HAZOP



A "Hazard & Operability" (HAZOP) study is a detailed process of identifying not only hazards but operability problems as well. Generally, a HAZOP analysis deals with the identification of potential deviations from the design intent, examination of their possible causes, assessment of their consequences and likelihood of occurrence as well as review of existing safeguards.

Our certified HAZOP leader along with experienced scribes will guide the multi-disciplinary team of project and operations staff through each HAZOP session in order to ensure comprehensive risk management by providing state-of-the art technical and organizational solutions.

## Why HAZOP?

- Incorporate **inherent safety** features into the detailed design stage of a new facility
- **Re-validate** the overall safety level of operating facilities by reviewing existing technical and organizational measures
- Find **hidden hazards** in fully matured processes through a systematic and structured examination
- Apply **cost effective** improvements following a risk-based approach

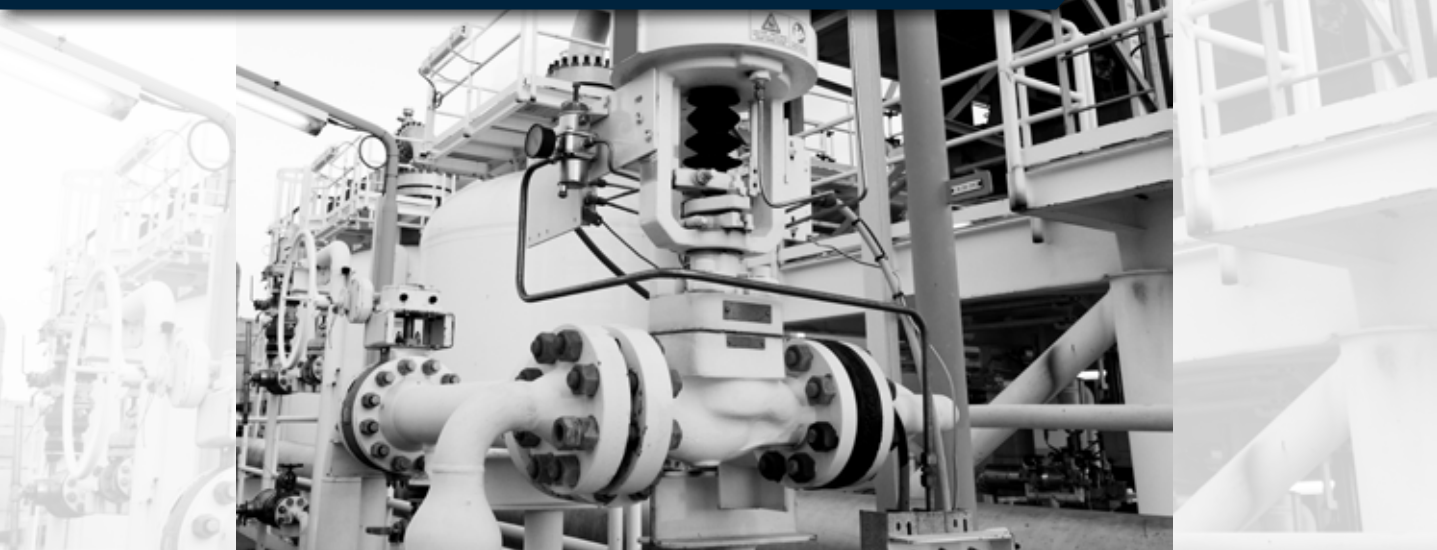
## process design

### Why LOPA?

- **Assess** existing safeguards whether they can be considered IPLs in terms of independency, effectiveness and auditability
- Make **informed decisions** between alternative IPLs for cost-effective risk mitigation by applying inherently safer designs
- Determine the **Safety Integrity Level (SIL)** when a Safety Instrumented Function (SIF) is required to maintain a process within tolerable risk criteria
- Exploit the **synergy** between LOPA and Bow Ties to visualize risks and communicate them throughout the organization

Layers of Protection Analysis (LOPA) is more than a risk assessment method. It is a powerful engineering tool for judging whether there are sufficient Independent Protection Layers (IPLs) to control the risk of an accident for the scenario under consideration. By taking into account the initiating event frequency and the probabilities of failure on demand (PFD) of the applicable IPLs, the frequency of the scenario under consideration is calculated and the risk is, in this way, evaluated.

Since LOPA is a semi-quantitative method, the conclusions are more "objective" when compared to a qualitative method and at the same time quicker and more comprehensible than those of fully quantitative analyses.



## SIL Verification

If after a HAZOP and LOPA study the need for a Safety Instrumented Function (SIF) is identified, it is very important to ensure that the required Safety Integrity Level (SIL) has been achieved in accordance with the requirements of IEC 61508/IEC 61511.

In this context, the most reliable, robust and cost effective Safety Instrumented System (SIS) will be chosen, whose elements and architecture will comply with the provisions set in the Safety Requirements Specification (SRS) in terms of design and engineering.

## Why SIL Verification?

- Chose the **optimum combination** of components to achieve functional safety and demonstrate SIL achievement
- Installation and commissioning **validation**
- Determine **proof test** intervals
- Ensure that the required risk reduction is maintained **throughout safety lifecycle** by specifying operations and maintenance procedures

# **PROACT**

*with HAZOP  
LOPA & SIL*



**A** 42 Ipirou Street, Haidari  
GR - 12461, Greece

**W** [www.proact.gr](http://www.proact.gr)

**T** +30 2102208492

**E** [info@proact.gr](mailto:info@proact.gr)