



Optimize the safety & risk management of your process system in accordance with industry best practices without compromising safety, environment and cost.

Process Hazards Analysis Services (PHA)

For Safety & Risk Management of Process System

HAZard and OPerability (HAZOP) analysis is a structured technique to perform a systematic study of a process using guide words to discover how deviations from the design intent can occur in equipment, actions or materials, and whether the consequences of these deviations can result in a hazard.

Why HAZOP?

Hazard Identification is a key phase in the safety management of a facility. Only identified hazards can be analyzed, assessed, managed, and mitigated if warranted. However, the usefulness of the hazard identification process is now expected to extend beyond the initial identification phase; for example, to provide inputs to management of change, written procedures, and incident investigation.

HAZOP Methodology

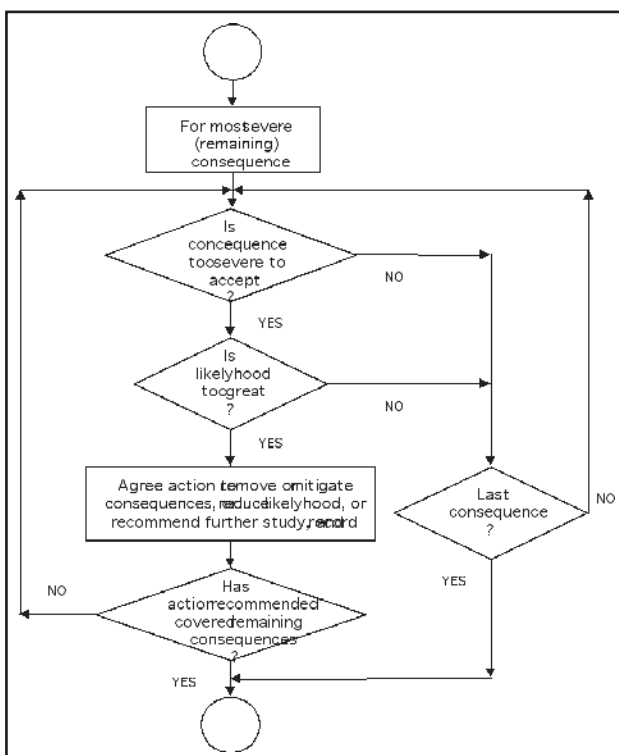
VELOSI uses a number of techniques assisted by software tools and models for safety and risk management of process systems. There are many well established hazard identification techniques (onshore & offshore). The CCPS text "Hazard Identification Procedures, 2nd Ed" provides a good introduction to several, including:

- HAZOP
- Checklist
- FMEA
- What-If
- Fault-tree analysis

In addition to these basic techniques, there are other techniques, typically combinations or enhancements of the above techniques:

- SWIFT (Structured What-If Checklist)
- Specialist Offshore HAZOP (Drillers, Divers, Well Test, and Installation)

VELOSI selects the correct technique to achieving a successful result based on experience and industry trends.



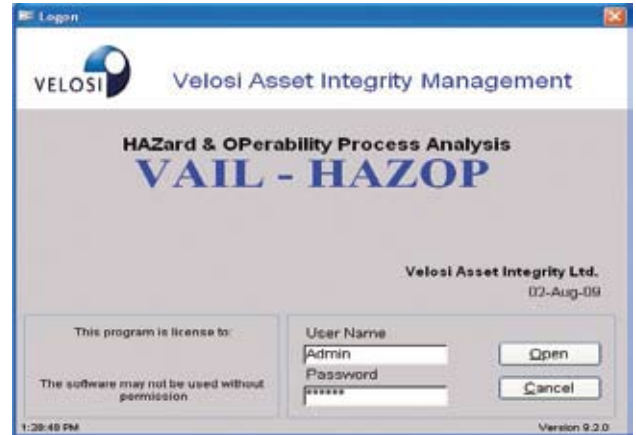
Judgment of Scenario Acceptability

Risk Ranking

VELOSI uses a 5x5 risk matrix for risk ranking of hazards. The hazard level consists of one number and one letter. The letter of the hazard level represents the Frequency of Occurrence. The number of the hazard level represents the severity level.

RISK POTENTIAL MATRIX

SEVERITY	People	Assets	Environment	FREQUENCY				
				A Frequent 1 in 100,000+	B Frequent 1 in 10,000+	C Occasional 1 in 1,000+	D Probable 1 in 100+	E Frequent 1 in 10+
5. Catastrophic	Multiple fatalities or permanent total disabilities	Extensive damage	Major effect					
4. Severe	Single fatality or permanent total disability	Major damage	Major effect					
3. Critical	Minor injury or health effects	Local damage	Localized effect					
2. Marginal	Minor injury or health effects	Minor damage	Minor effect					
1. Negligible	Slight injury or health effects	Slight damage	Slight effect					



Logon view

When HAZOP is useful:

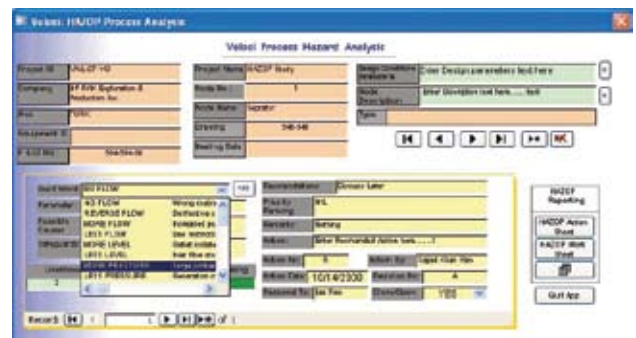
- During the design or installation of any new plant or process or major modification to an existing one
- When there are novel hazards such as environmental hazards and quality or cost issues related with operation
- Following a major incident involving fire, explosion, toxic releases etc.
- To justify why a particular code of practice, guidance note or industry code not to be followed

Software tool used for HAZOP Study

VAIL-HAZOP is a VELOSI's in-house developed software for HAZOP study. VAIL-HAZOP was developed by using API 750, API 14J & API 1150 as reference documents.

VAIL-HAZOP features:

- Windows-based application, easy-to-use with attractive Graphical User Interface
- Project Team & Session Recording and Dynamic Reporting with respect to project and facility
- Nodes data and scenarios recording
- Dynamic action sheet and worksheet generation
- Strong security policy. It is password enabled to avoid unauthorized access
- Analysis summary
- Actions and tasks allocation, their status and priority ranking



HAZOP study screen view