

Plant Design Optimisation & Risk Assessment (HAZOP)



All production and treatment plants and processes contain inherent risks, regardless of industry type. Risks have the potential to impact not only on worker safety and the environment, but also on systems operability and company profits. To manage and minimise risks, a detailed HAZOP study is required.

The term HAZOP refers to a **HAZard and OPerability study**, which is a hazard identification technique developed by the process industries, and now widely applied as part of any risk management and design optimization strategy. The HAZOP technique is a framework that enables a team of people with the appropriate skills to systematically examine a process or plant and identify potential hazards and operational problems that might arise as a result of deviations from the intended operating conditions. A HAZOP involves a multi-disciplinary team, with the HAZOP leader facilitating input from a variety of experts, each with very specific knowledge or understanding of a component of the plant and or process. The HAZOP investigation can be used to manage design, construction, operation and maintenance risks related to aspects concerning the design intent and operation of the process.



Sustainable Solutions International Pty Ltd (SSI) has developed HAZOP software, **HAZPro®** that streamlines the HAZOP process and provides a structured risk assessment and design review process.

HAZOP Analysis

The objective of a HAZOP is to identify hazards and operational problems in a process plant or process and determine a list of actions required to assess, and if required increase, the overall safety and operability of an industrial process. This process includes:

1. Identifying the potential hazards of a plant or process to:

- Worker health and safety;
- Product quality and customer health;
- Environmental pollution;
- Operational failures that result in down-time;
- Construction risk;
- Equipment selection risks; and
- Operational and maintenance risks.



2. Documenting the existing design safeguards to prevent the above hazards;

3. Identify further safeguards or control measures, if required, to prevent the above hazards;

4. Determine a clear course of action to improve the safety and operability of the plant or process; and

5. Modify and optimise the plant design, operation and maintenance procedures.



Hard hat



Eye protection



Dust mask



Ear protection



Protective clothing



Face Shield



Gloves



Safety footwear



Harness



Welding mask

Asset & Maintenance Management

Design Construction Management & Commissioning

Efficiency Audits & Cleaner Production

Environmental Compliance & Licensing

Master Planning

Plant Assessment & Optimisation

Sustainable Resource Management

Risk Assessments (HACCP & HAZOP)



For more information please contact:
Sustainable Solutions International Pty Ltd

07 3255 0000

office@ssi-bne.com

sustainablesolutionsinternational.com

Water.Energy.Waste.

1L
Think before you print.

A HAZOP analysis can encompass risk analysis of specific life cycle stages of the plant, or comprehensively cover the complete life of the plant, including:

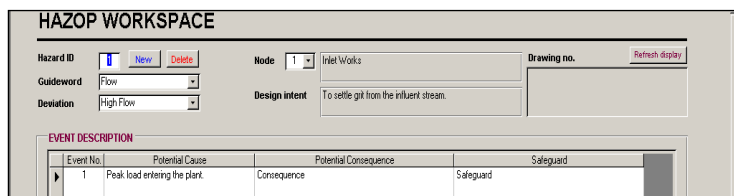
- Concept and location selection;
- Detailed design;
- Construction and installation;
- Commissioning;
- Operation and maintenance; and
- Decommissioning and site clean up.

The detailed design stage is generally the best time for a HAZOP analysis as this allows any changes required to be made with economic benefits.

Benefits of performing a Risk Analysis

The benefits of performing a HAZOP include:

- Identification and awareness of the causes of operational failure;
- Identification of the potential hazards associated with system failure;
- Identification and mitigation of risks;
- Improved operational efficiency and reliability;
- Protect company reputation;
- Optimising plant design and cost; and
- Reduces company risk of litigation or fines resulting from injury and environmental damage.



Event No.	Potential Cause	Potential Consequence	Safeguard
1	Peak load entering the plant.	Consequence	Safeguard

What we deliver

SSI work one-on-one with our clients to complete a thorough hazard analysis of their existing or proposed processes. After the completion of the analysis using our own hazard assessment software package, SSI is able to generate a HAZOP report and a hierarchical recommendations list.



Plant Design Optimisation & Risk Assessment (HAZOP)

Key Projects

Coppabella Mining Camp

SSI conducted a HAZOP on the WWTP, and a HACCP on the recycled water produced as part of a sustainable Water and Wastewater Management Plan developed by SSI for this remote mining camp. The camp caters for 1800 people with no access to council supplied water or sewerage. SSI was also involved in the design and construction of water and wastewater treatment plants.



The Ecovillage at Currumbin

SSI conducted a HAZOP on the WWTP, and a HACCP on the recycled water produced as part of the integrated water management strategy for this village of 144 eco-homes, leading to the development of new passive water treatment technologies which allowed the recycling of waste water for non-potable domestic uses.

Aqua Clarus

HAZOP on a package waste water treatment plant to ensure suitability for the site and load, as well as to ensure that operational risks were minimized.

Clybucca BP Roadhouse

SSI performed a detailed WWTP performance assessment and site water audit to reduce water consumption at the site. A HAZOP analysis was completed by SSI as part of the design and construction of a new WWTP for the site.

Mayne Health

HAZOP conducted on a trade waste treatment plant designed, project managed and commissioned by SSI. The HAZOP included risk assessment at all stages, including operational and maintenance risks.

Ingal

HAZOP conducted on an industrial galvanizing plant in Victoria as part of gaining EPA approvals. The HAZOP included worker, public and environmental safety risks associated with all production stages, including analysis of business risks posed by potential safety breaches



Asset & Maintenance Management	Design Construction Management & Commissioning	Efficiency Audits & Cleaner Production	Environmental Compliance & Licensing	Master Planning	Plant Assessment & Optimisation	Sustainable Resource Management	Risk Assessments (HACCP & HAZOP)
--------------------------------	------------------------------------------------	----------------------------------------	--------------------------------------	-----------------	---------------------------------	---------------------------------	----------------------------------



For more information please contact:
Sustainable Solutions International Pty Ltd

07 3255 0000

office@ssi-bne.com

sustainablesolutionsinternational.com

Water.Energy.Waste.

