Hazard and Operability (HAZOP) Studies for Supervisors/Team Leaders

COURSE OVERVIEW

HAZOP (Hazard and Operability) study is one of the most widely used hazard identification methods in the world and is utilized across many different industries. Countless potential risks and problems can be identified by using the systematic and structured approach of HAZOP. A successful HAZOP study is only possible if the study is guided effectively. This training course is intended to provide participants with the skills needed to lead successful Hazard and Operability Studies for all types of processes. Participants will have sufficient understanding of and practice in the disciplines required for leading a HAZOP so that in their particular business environment, they will be able to maximize the value of the HAZOP process for identifying potential hazards and assessing solutions.

IMPORTANT FEATURES

The important features of the Hazard and Operability (HAZOP) Studies training course include:

- Review of basic HAZOP skills
- HAZOP team leadership skills
- Application to batch systems (Batch HAZOP studies)
- Detailed planning for effective HAZOP
- Protective systems importance in HAZOP
- Complementary HAZOP techniques, e.g. fault and event tree analysis
- Ensuring HAZOP quality
- Auditing – self-assessment techniques

LEARNING OBJECTIVES

Upon attendance to the Hazard and Operability (HAZOP) Studies training course, participants will be able to:

- Introduce the role, responsibilities, and conduct of HAZOP team leader
- Provide sufficient hands-on experience in the application of the HAZOP to different processes, systems and machinery
- Appreciate the application of HAZOP methodology in other areas of interest, e.g., human reliability and human HAZOP
- Understand the consequences of flammable/toxic releases, fire and explosion dispersion modeling

TARGET AUDIENCE

The Hazard and Operability (HAZOP) Studies training course is suitable for personnel who are required to lead HAZOP studies in any industry, especially:
- Operations and Maintenance Personnel
- Process, Reliability and Quality Control/Assurance Personnel
- HSE Technical Personnel
- Project Engineers
- Anyone who needs a general understanding of the HAZOP process

**TRAINING METHODOLOGY**

This practical and results-oriented training course is based on HAZOP methods and its application. It incorporates short inspiring lectures with structured lessons from the learning manual; workshop to apply and enhance the HAZOP study skills; ongoing discussions with action planning; ample time for Q&A; training activities to reinforce key concepts within a fun learning environment.

*Pre & Post course assessments will be used to measure the effectiveness of this training.*

**COURSE CONTENTS**

**Module 1 - Basic Concepts and Introduction to Risk Assessment**

- **KeyTopics:**
  - Hazards and Risks
  - Types of Hazards - Fire & Explosion
  - Types of Hazards - Toxic Materials
  - Preliminary Hazard Analysis
  - Consequence Analysis
  - Risk & Harm
  - Risk Graph
  - The ALARP Principle
  - Risk Reduction in Process Plants
  - Risk & Cost Calculations for bean counters
  - Layers of protection in the Process Industries
  - Diversity
  - Preventive and Mitigated Layers
  - The concepts of hazards, risk and risk assessment
  - Human contribution to accidents
  - Methods of risk evaluation
  - Integrating risk assessment within risk management
  - Semi-quantitative risk assessment techniques
  - Risk assessment framework – the role of HAZOP

**Module 2 - HAZOP Types, Standards & Legal Requirements**
• **KeyTopics:**
  - Review of basic HAZOP skills
  - HAZOP Standards
  - HAZOP Standards
  - HAZOP as legal requirement
  - The Seveso Directives
  - HAZOP-OSHA
  - HAZOP-UK HSE
  - Types of HAZOP
  - Greenfield HAZOPs
  - Concept HAZOP
  - Basic Design HAZOP
  - Detailed HAZOP
  - Commissioning HAZOP
  - Brownfield HAZOP
  - CHAZOP

**Module 3 - Managing HAZOPs**

• **KeyTopics:**
  - Why is managing HAZOPs so important?
  - Management Support
  - HAZOP Team composition and roles and
  - HAZOP Consultants
  - Role of HAZOP Leader
  - Role of HAZOP Secretary
  - Role of HAZOP team members
  - Team Skill Level
  - HAZOP Documentation
  - Auditing a HAZOP

**Module 4 - HAZOP Protocols and Methodology**

• **KeyTopics:**
  - Information needed for HAZOP
  - Stages of HAZOP Study
  - Initial meeting
  - Introduction
  - Terms of reference
  - Scope of the review
Module 5 - Overview of Hazard Evaluation

- **KeyTopics:**
  - Process hazards
  - Hazard identification
  - Predictive hazard evaluation
  - Hazard evaluation study
  - Preliminary hazard analysis (PHA)
  - What if analysis
  - FMEA: Failure mode and effect analysis
  - FTA: Fault tree analysis
  - Event tree analysis
  - HAZOP Applications, Case Studies, and Worked Examples