Hazard Identification and Operability Studies (HAZOP): A Systematic Approach to Process Safety and Risk Management

Course general description:

Hazard Identification and Operability Studies (HAZOP) is a structured and systematic technique widely used in process industries to identify potential hazards and operational issues in industrial processes. This course provides participants with a comprehensive understanding of the **HAZOP** methodology, its application, and its role in ensuring process safety and operational efficiency. Through lectures, practical exercises, case studies, and interactive discussions, participants will gain hands-on experience in conducting **HAZOP** studies and interpreting their results effectively.

Audience:

This course is intended for:

- Process engineers and safety professionals
- HAZOP team leaders and facilitators
- Plant operators and maintenance personnel
- HSE (Health, Safety, and Environment) managers
- Project engineers and design engineers
- Anyone involved in process safety, risk management, or operational improvement

Course objectives:

By the end of this course, participants will be able to:

- Understand the principles, purpose, and benefits of HAZOP studies.
- Identify deviations from design intent using guide words and parameters.
- Conduct a HAZOP study systematically and document findings accurately.
- Interpret HAZOP results to recommend corrective actions and improve process safety.
- Comply with international standards and best practices for HAZOP implementation.
- Facilitate or participate effectively in HAZOP teams.

Course duration:

5 days

Course location:

Dubai

Course contents:

Day-1: Introduction to HAZOP and Fundamentals

- Pretest to assess participants' baseline understanding of HAZOP principles
- Overview of HAZOP: History, purpose, applications, and its role in process safety.
- Regulatory frameworks and industry standards (IEC 61882, OSHA PSM).
- Key concepts: Guide words, process parameters, and deviations.
- Group activity on identifying deviations using guide words and process parameters.

Day-2: Conducting a HAZOP Study

- Step-by-step methodology for conducting a HAZOP study.
- Roles and responsibilities of HAZOP team members.
- Preparing for HAZOP: Data collection, PFDs, and P&IDs.
- Documenting findings: HAZOP worksheets and reports.
- Hands-on tutorial: on completing a HAZOP worksheet and analyzing a real-world HAZOP report.

Day-3: Advanced HAZOP Techniques and Tools

- Advanced guide words for addressing complex systems and multi-stream processes.
- Software tools for HAZOP (PHA-Pro, HAZOP Manager).
- Integrating HAZOP with other risk assessment techniques (HAZID, FMEA).
- Practical exercise using software for HAZOP studies and comparing manual vs. software-based approaches.
- Quiz on advanced HAZOP techniques and tools.

Day-4: Interpreting Results and Implementing Recommendations

- Analyzing HAZOP findings and prioritizing recommendations.
- Developing action plans for risk mitigation.
- Effective communication of HAZOP results to stakeholders.
- Group discussion on prioritizing recommendations based on severity and likelihood.
- Case study on tracking HAZOP recommendation implementation in a refinery.

Day-5: Best Practices and Final Assessment

- Common pitfalls and challenges in HAZOP studies.
- Best practices for effective HAZOP facilitation.
- Review of key concepts and emerging trends in HAZOP (AI, digitalization).
- Final written assessment covering all course topics.
- Post-course feedback session and posttest evaluation of learning outcomes.

Methodology:

- 50% lectures & concepts
- 10% Videos
- 10% Case studies
- 10% Exercises
- 10% Discussions

Course code: (THSE014)