



Process Hazard Analysis (PHA)

Duration 5 Days

Introduction

This course provides an introduction about the Process Hazard Analysis (PHA) methodology in identifying, controlling and mitigating hazards in industrial plants. It will provide participants with the knowledge on hazard identification methodologies commonly used in the industry, the accident investigation methodology, and causation model and bow-tie diagram. This course also aims to provide participants with the knowledge on risk assessment

Who Should Attend

- Typical audience of this course are process engineer, project engineer, operations supervisors, PSM, coordinator, EHS Managers & Engineers

Course Objectives

Upon completion this program Participants will be able to:

- ↳ To build an understanding of the concepts of Process Hazards Analysis (PHA) and a basic understanding of the major techniques for hazard identification and when each should be used.
- ↳ To provide an understanding of the responsibilities involved in PHA leadership and training in the skills necessary for leading PHA studies.
- ↳ To provide basic skills in the use of the What-If and HAZOP techniques and to provide training in the use of software as a tool in the facilitation of Process Hazards Analysis.

Course Outlines:

1. Background

- 1.1. Relationship of hazard evaluation to risk management strategies.
Elements of a process Accident
- 1.2. Hazard Evaluation throughout a Project Lifetime
- 1.3. Limitations of Hazard Evaluation

2. Preparing for Hazard Evaluation Studies

- 2.1. Infrastructure
- 2.2. Analysis Objectives and Scope
- 2.3. Information Requirements
- 2.4. Personnel and Skills
- 2.5. Schedule and Execution

3. Hazard Identification Methods and Results

- 3.1. Analyzing Material Properties and Process Conditions
- 3.2. Using Experience
- 3.3. The interaction matrix technique,
- 3.4. Using Hazard Evaluation Techniques to Identify Hazards
- 3.5. Hazard Identification Results

4. Overview of Hazard Process Analysis Techniques

- 4.1. Safety Review
- 4.2. Checklist Analysis
- 4.3. Relative Ranking
- 4.4. Preliminary Hazard Analysis
- 4.5. What-If Analysis



- 4.6. What-If/Checklist Analysis
- 4.7. Hazard and Operability Analysis, (HAZOP)
- 4.8. Failure Modes and Effects Analysis
- 4.9. Fault tree Analysis
- 4.10. Event Tree Analysis
- 4.11. Cause – Consequence Analysis
- 4.12. Human Reliability Analysis
5. **Selecting Hazard Evaluation Techniques**
 - 5.1. Factors Influencing the Selection of Hazard Evaluation Techniques
 - 5.2. Decision-Making Process for Selecting Hazard Evaluation Techniques
 - 5.3. Example Using the Proposed Selection Criteria
6. **Using Hazard Evaluation Techniques**
 - 6.1. Safety Review
 - 6.2. Checklist Analysis
 - 6.3. Relative Ranking Techniques
 - 6.4. Preliminary Hazard Analysis
 - 6.5. What-If Analysis
 - 6.6. What-If/Checklist Analysis.
 - 6.7. Hazard and Operability Analysis (HAZOP)
 - 6.8. Failure Modes and Effects Analysis
 - 6.9. Fault Tree Analysis
 - 6.10. Event Tree Analysis
 - 6.11. Cause-Consequence Analysis
 - 6.12. Human Reliability Analysis