

# Process Safety Management—Fundamentals

## 2-Day Course

### Instructor: Mr. John R. Lockwood

**Program Content:**

This short course is designed to teach and apply the fundamentals of chemical process safety.

**Objectives:**

- To provide a basic understanding of Process Safety and the requirements of OSHA PSM Regulation 29 CFR 1910.119 and EPA Risk Management Plan 40 CFR Part 68.
- To understand through case studies how the failure of Process Safety management elements were found to be the root cause of major incidents in the petroleum industry.
- To provide information on how to implement, monitor, and audit a Process Safety Management program.
- To illustrate through exercises the identification of hazards and the ranking of risks.

**Day 1:**

- Module 1: Introduction
  - Course administration
  - Course participants
  - Objectives of the course
  - History of Process Safety legislation in the USA illustrated through past events
  - What is Process Safety?
  - Process Safety concepts and overview of the PSM elements
- Module 2: Process Safety Management Elements (Description of Each Element)
  - Documentation
  - Employee Participation
  - Accountability and Leadership
  - Process Safety Information
  - Process Hazard Analysis
  - Mechanical Integrity; Case Study: “Humber Refinery—Catastrophic Failure of De-Ethimizer Overhead Pipe”
  - Safe Work Practices (Hot Work); Case Study: “Piper Alpha Disaster”
  - Contractor Management
  - Operating Procedures; Case Study: “Feyzin LPG Disaster”
  - Training and Competence
  - Management of Change; Case Study: “Flixborough Disaster”
  - Pre-Startup Safety Review
  - Emergency Planning and Response; Case Study: “Major Tank Fire”
  - Incident Investigation
  - Process Safety Audit
  - Trade Secrets

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#### Day 2:

- Module 3: Life Cycle Model
  - Holistic Approach
  - Inherent Safety
  - Project Management and Process Safety
  - Getting it “Right”
- Module 4: Hazards and Consequences
  - Types of Failures releasing hazardous materials
  - Video Session documenting vapor cloud, flash fire, explosion (deflagration and detonation), pool fire, BLEVE, Boil-over
  - Toxic Releases
  - Facility Siting
- Module 5: Risk and Risk Analysis Methodologies
  - Hazard and Risk
  - Types of Risk
  - Swiss Cheese Model
  - LOPA (Layer of Protection Analysis)
  - Risk Matrix
  - Risk Criteria/Acceptability
  - Risk Controls (Prevention, Control, Mitigation)
  - HAZOPS Study
  - Task Risk Assessment—Exercise
- Module 6: Human Factors
  - A Just Safety Culture
  - Ergonomics, fundamental behavior, human error
- Module 7: Texas City Disaster
  - Presentation/Video
  - Exercise: Draw out the holes in the protective barriers using the Swiss Cheese Model
- Module 8: PSM and Other Management Systems
  - Using Synergy from Other Management Systems (ISO 9001, 14001 & OSHA 18001)
  - TQM (Total Quality Management)
  - Gap Analysis
  - Key Process Safety Indicators
  - Audits
- Module 9: Course Summary Followed by an Open Quiz

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**Process Safety Management—Fundamentals (Cont.)**  
**2-Day Course**  
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**Who Should Attend?**

The course content is diverse enough for use by anyone involved in improving process safety; including chemical engineers, mechanical engineers, safety and health personnel, industrial hygiene personnel, and operators, and maintenance supervisors.

**Dates:**

November 12-13, 2014

April 7-8, 2015

**Location:**

Phoenix Contact Customer Technology Center; Houston, TX

1.4 CEUs	14 PDHs
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