



Manufacturers are challenged with making their units last longer and are being required to bring older units up to safety standards, understanding Safety Integrity Level (SIL) ratings and Safety Instrumented Systems (SIS). New technologies available in field devices and control systems can have a significant impact in helping manufacturers comply with OSHA standards for process safety.

Clearly, safety is an area everyone involved in process operations needs to be educated about. In addition to the plant safety that can be derived from knowing how to properly choose, configure and operate automation systems, field devices and other process control elements, basic understanding of the underpinnings of regulatory compliance is critical to operational safety.

Taught by safety experts, these courses provide managers, engineers, and others responsible for plant safety a working knowledge of OSHA standards, process hazard analysis, and the fundamentals of process safety management.



Plant Safety Leading business schools rarely devote time to one of the most necessary and practical aspects of managing any industrial process - employee safety and the safe operation of equipment. Yet, poor safety practices can have a major negative impact on any business enterprise. Emerson Process Management recognizes the importance of management leadership in setting high safety standards and enforcing safety rules throughout every plant. Safety begins at the top, and our expanding offerings in the realm of safety are designed for top operating managers as well as safety professionals.



Preventing Catastrophic Accidents-The Fundamentals

Course 2710 CEUs: 1.4

This course is designed to introduce safety professionals and operating managers to the effective prevention of accidental releases of hazardous materials.

Overview

This 2-day course uses case studies, graphics and video training materials to comprehensively illustrate the latest information in the profession. Topics include design, implementation and maintenance of those management systems proven effective over the years by top industry leaders. In addition, federal and state regulations, including OSHA's Process Safety Management and EPA's Risk Management Program, are discussed in detail. Course attendees will learn the latest thinking on inherent safety, accident prevention, and release mitigation, from the perspective of effective risk management.

Topics

- What is Process Safety?
 - Fire and Explosion
 - Toxic Release
 - Chemical Reactivity
- Historical Perspective, Including Bhopal, Pepcon, Phillips Pasadena
- Regulations - PSM, RMP, General Duty
- Performance Standards and Management Systems
- Barriers to Improvement
 - The Era of Mergers and Acquisitions
- Concepts of Risk
 - Inherent Safety - Design and Operation
 - Instrumentation and Process Control
 - Plant Layout and Spacing
- Examination of Program Elements
 - Employee Participation/Human Factors
 - Process Safety Information
 - Process Hazard Analysis
 - Event Scenarios, Consequence Analysis
 - Operating Procedures
 - Training/Certification
 - Mechanical Integrity
 - Management of Change
 - Incident Investigation
 - Emergency Preparedness
 - Audits

Price Call to Discuss

Location **Start Dates 2009**
 Call to Schedule 800-338-8158/641-754-3771

Breakthrough Leadership in Safety for the Chemical Process Industry

Course 2711 CEUs: 2.1

This course is designed for experienced safety professionals and operations managers seeking to expand their leadership effectiveness.

Overview

This 3-day course utilizes actual case studies, team building activities, and videos, to sharpen participant's skills in leading organizations to exceptional performance in accident prevention for the chemical and petroleum industries. The course integrates the latest research on risk management in the CPI, with leadership lessons from the most successful companies.

Prerequisites Participants will have taken an introductory course such as 2710, and be knowledgeable about the key elements of Process Safety Management.

Topics

- Roles and Responsibilities of Professional Managers in Today's CPI
- Understanding Risk
 - Traditional and Expanded Definitions
 - Recognizing Risk in the Workplace
- Hazardous Materials
 - Operation of a Facility with Hazardous Substances, within Today's Society
- Corporate Culture
 - Management Philosophy
 - Examples of Safety Excellence, Best Practices
- Values
 - Guide to Organizational Standards
 - Balancing Competing Demands
- Management Actions and Behaviors
 - Communication
 - Recognizing Need for Improvement
- Review of Mandatory Elements
 - Regulatory Requirements
 - Compliance Audits
- Influencing a Company to Have an Effective Safety Program
 - Respecting Individuals
 - Valuing/Empowering Employees
 - Encouraging Idea Flow
 - Releasing Employees to Accomplish Goals

Price Call to Discuss

Location **Start Dates 2009**
 Call to Schedule 800-338-8158/641-754-3771

PSM (Process Safety Management) Fundamentals

Course 2720 CEUs: .7

This one day course is designed for managers, engineers, technicians, mechanics, operators, and other personal that work in a facility covered by OSHA's Process Safety Management standard.

Overview

If you want to quickly introduce your workers to the OSHA PSM standard this is the course. Participants will learn about each of the 14 elements of Process Safety Management, with special emphasis on Management of Change, Process Hazard Analysis and Pre-startup safety reviews. Each participant will be provided with a work manual to assist in future compliance and the strengthening of PSM program elements that exist in their facilities.

Topics

- The Regulations:
 - Regulation History, Summary, Definitions, Compliance, Interpretations, and Citation Insights
 - Covered Processes and Application Issues for Both PSM and RMP
- Elements of the Regulations:
 - Employee Participation
 - Process Safety Information
 - Process Hazard Analysis
 - Operating Procedures
 - Training
 - Contractors
 - Pre-Startup Safety Review
 - Mechanical Integrity
 - Hot Work Permit
 - Management of Change
 - Incident Investigation
 - Emergency Planning and Response
 - Compliance Auditing
 - Trade Secrets
- Hands on Sample Problems Worked During Course

Price \$600

Location **Start Dates 2009**
 Call to Schedule 512-834-7689

OSHA 10 Hour General Industry Outreach

Course 2722 CEUs: 1.0

This 10-hour course is designed for managers, engineers, technicians, mechanics, operators, and other personal that work in any manufacturing facility.

Overview

If you want to quickly introduce your workers to the application of OSHA standards in the work environment this is the course. It covers the OSHA standards that are most commonly cited and provides participants with an intensive study of occupational safety and health compliance. The objective is to reduce/ prevent costly, time-consuming injuries/illnesses.

Topics

- Introduction to OSHA
- OSHA and Your Company
- The OSH Act
- General Duty Clause 5 (a) (1)
- Inspections/Citations/Penalties CFR Part 1903
- Subpart D: Walking and Working Surfaces
- Subpart E: Means of Egress/Evacuation
- Subpart H: Flammable/Combustible Liquids
- Subpart I: Personal Protective Equipment
- Subpart J: Lockout/Tagout
- Subpart L: Fire Protection-Emergency Action Fire Teams
- Subpart O: Machine Guarding
- Subpart S: Electrical
- Subpart Z: Hazard Communication

Students completing this course should:

- Discuss OSHA's current emphasis and enforcement policy.
- Describe the OSH Act and 29CFR 1910;
- Identify selected safety and health hazards and OSHA standards;
- Describe abatement methods for selected safety and health hazards;
- Explain and apply workplace inspection procedures consistent with OSHA policies, procedures, and directives.

Price \$300

Location Call to Schedule **Start Dates 2009** 512-834-7689

Facilitating HazOps

Course 2724 CEUs: 1.4

This course is for process safety personnel who have participated in HazOps and want to learn how to facilitate a HazOp.

Overview

This 2-day course is a hands-on, instructor-led course. The course addresses how to prepare for a HazOp, how to identify HazOp nodes on a P&ID, how to conduct a HazOp (including tips on keeping the team moving and dealing with disruptive team members), and the format for compiling and reporting the results of the HazOp. The course includes a synopsis of other techniques that can be used for conducting a Process Hazard Analysis and when those techniques may be preferred over the HazOp. The course wraps up with a review of how to estimate the time and cost of a HazOp.

Prerequisites Course 2721, PHA Fundamentals Training, or equivalent experience

Topics

- Techniques for Conducting a PHA
- When a HazOp Should be Used Versus Other Techniques
- Preparing for a HazOp
- Defining Nodes
- Team Selection
- Conducting a HazOp
- Guide Words
- Working with a Scribe
- Compiling a HazOp
- Reporting Format
- Estimating the Cost of a HazOp

Price \$1,100
Call to discuss pricing at your location

Location St. Louis, MO **Start Dates 2009** Call to Schedule 512-834-7689

Fault Tree Analysis

Course 2725 CEUs: .7

This course is for process safety personnel who need to use fault tree analysis to estimate the probability of failure on demand of safety critical systems.

Overview

This 1-day course is a hands-on, instructor-led course that prepares students to set up and use fault trees to analyze the probability of failure on demand for safety instrumented functions more complex than can be readily calculated by standard SIL verification software. It includes examples and exercises for students to work on individually and in groups.

Topics

- Probability
- Fault Tree Symbolology
- Failure Rate Data
- Gate Calculations
- Mutually Exclusive and Independent Events
- Common Mode Failure
- Other Fault Models

Price \$600
Call to discuss pricing at your location

Location St. Louis, MO **Start Dates 2009** Call to Schedule 512-834-7689

To enroll in Plant Safety 2720-2731 call 512-834-7689. For 2710-2711 courses call 800-338-8158. For additional contact information refer to the appropriate contact on page 119. Updated dates & locations are available on our website at www.emersonprocess.com/education.

Risk Assessment -Off-Site Consequences

Course 2726 CEUs: .7

This course is for process safety personnel who quantify the consequences of safety incidents for the purposes of quantifying risk.

Overview

The US EPA's guidance documents on off-site consequence analysis (OCA) describe how the consequence component of risk should be determined for both worst cases and alternative cases. While other tools are available, the EPA OCA guidance is widely used, and the basis of comparison for most discussions with the public. This one day course explains the theory behind these EPA-approved techniques, and trains students in their use through a combination of lecture, discussion, and hands-on exercises. The course wraps up with an exercise in the use of the EPA software, RMP*Comp, and a review of the requirements for an EPA Risk Management Plan.

Topics

- Toxic Gas Releases
- Liquid Spill and Vaporization
- Vapor Cloud Explosions
- BLEVE (Boiling Liquid Expanding Vapor Explosions)
- Pool Fires
- Jet Fires
- RMP*Comp
- EPA Risk Management Plans

Price \$600

Call to discuss pricing at your location

Location

St. Louis, MO

Start Dates 2009

Call to Schedule
512-834-7689

Layers of Protection Analysis

Course 2727 CEUs: .7

This course is for process safety personnel who quantify the likelihood of safety incidents for the purposes of quantifying risk.

Overview

Layers of Protection Analysis, or LOPA, is a specialized version of event tree analysis that allows an analyst to quantify, within a half order of magnitude, the likelihood of safety critical event. This technique is gaining increasing acceptance in the process industries and is specifically cited in SIS standards. This one day course will prepare students to develop scenarios, evaluate safeguards as potential layers of protection, and use appropriate probabilities for IPL in order to calculate frequency, or likelihood, of safety critical scenarios.

Topics

- Developing scenarios
- Initiating event frequency
- Independent protection layers
- Frequency of scenarios
- Using LOPA

Price \$600

Call to discuss pricing at your location

Location

St. Louis, MO

Start Dates 2009

Call to Schedule
512-834-7689

Incident Analysis

Course 2728 CEUs: .7

This course is for process safety personnel who participate in or lead incident investigation teams.

Overview

This one-day, instructor-led course uses a combination of lecture, discussion, and hands-on exercises to teach the skills necessary to effectively function as the leader of an incident investigation committee, and to analyze incidents in a systematic manner that assures improvement of the process that generated the incident.

Topics

- ESH Management Theory
- Human Behavior
- The Incident Analysis Process
- Interviewing Techniques
- Practice Cases

Price \$600

Call to discuss pricing at your location

Location

St. Louis, MO

Start Dates 2009

Call to Schedule
512-834-7689

P&ID Preparation

Course 2729 CEUs: .7

This course is for process design engineers responsible for preparing piping and instrument diagrams as part of front-end engineering design packages.

Overview

This one-day course is a hands-on, instructor-led course, complete with examples and exercises for the students to work on individually and in groups. It is not a course on drafting standards, but rather, a course for process engineers who must start with a clean sheet of paper and prepare P&IDs that then become the basis of design for all other engineering disciplines.

Prerequisites Familiarity with P&IDs and their symbology.

Topics

- Introduction to P&IDs
- Introduction to Process Flow Diagrams -PFDs
- Lead Sheets
- Preliminary P&IDs
- P&IDs "Issued for Design"
- Reviewing P&IDs
- Operating and Safety Considerations
- Management of Change

Price \$600
Call to discuss pricing at your location

Location St. Louis, MO **Start Dates 2009**
Call to Schedule
512-834-7689

Safety Engineering Overview

Course 2730 CEUs:1.4

This course is for project managers, supervisors, and team members who provide supporting roles on a Safety Instrumented System (SIS) Project.

Overview This 2-day instructor led course covers the Safety Lifecycle, terminology, and an introduction to industry standards such as IEC61508, IEC61511, and S84. Practical examples will cover the analysis, realization and operation of a safety instrumented system.

Topics

- SIS Terminology
- The Safety Lifecycle
- Risk and Probability
- Process Hazard Analysis (PHA)
- Risk Analysis
- SIL Determination
- Reliability Engineering
- SRS and SIS Design
- Start-up and Operation

Price \$1,100
Call to discuss pricing at your location

Location St. Louis, MO **Start Dates 2009**
Call to Schedule
512-834-7689

Elearning: Safety Engineering Overview

Course BSE101 CEUs:1.6

Audience Project managers, supervisors, and team members who provide supporting roles on a SIS project.

Overview This is a 16 hour on-line course which covers SIS terminology and the Safety Lifecycle, Risk and Probability, Process Hazard Analysis, Risk Analysis, SIL Determination, Reliability Engineering, SRS and SIS Design, and Start-up and Operation.

Note: Students will have email access to our Subject Matter Experts for the duration of their course subscription. Upon registration you will be sent the email address of these individuals. Any questions you have about the course material can be sent directly to them.

Price \$450
www.emersonprocess.com/education/elearning_sis.asp
Call to Register: 800-338-8158 or 641-754-3771

Safety Engineering

Course 2731 CEUs:2.8

This course is for professionals responsible for specifying and implementing Safety Instrumented Systems (SIS).

Overview This 4-day instructor led course covers the complete Safety Lifecycle. The IEC 61511 standard will be referenced and used as a guide through the analysis, realization, and operation of an SIS. Exercises will include process hazard analysis, SIL determination, SRS definition, and SIF design.

Topics

- SIS Terminology
- The Safety Lifecycle
- Risk and Probability
- Process Hazard Analysis (PHA)
- Risk Analysis
- SIL Determination
- Reliability Engineering
- SRS and SIS Design
- Start-up and Operation

Price \$2,200
Call to discuss pricing at your location

Location St. Louis, MO **Start Dates 2009**
Call to Schedule
512-834-7689

Elearning: Safety Engineering

Course BSE201 CEUs:3.2

Audience Professionals responsible for specifying and implementing SIS.

Overview This is a 32 hour on-line course which provides an in-depth look at the same materials and includes exercises to assist students with learning the course materials.

Note: Students will have email access to our Subject Matter Experts for the duration of their course subscription. Upon registration you will be sent the email address of these individuals. Any questions you have about the course material can be sent directly to them.

Price \$750
www.emersonprocess.com/education/elearning_sis.asp
Call to Register: 800-338-8158 or 641-754-3771

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