MAWA EVENTS

Address: No. 857, Block A2. Leisure Commerce Square - No 9., 46150 Petaling Jaya, Selangor, Malaysia

Phone: +601116373203 | **Email:** info@mawaevents.net

SAFETY IN PROCESS EQUIPMENT DESIGN & OPERATION

"Engineering Safer Systems Through Design, Operation, and Process Integrity"

Schedule

Date	Venue	Fees (Face-to-Face)
12 – 14 May 2026	Dubai, UAE	USD 2495 per delegate
10 – 12 Jun 2026	Dubai, UAE	USD 2495 per delegate
08 – 10 Sep 2026	Manama, Bahrain	USD 2495 per delegate

► **Available delivery methods:** Face-to-Face & Online Training

Introduction

Process safety is critical in preventing catastrophic failures, environmental damage, and loss of life in industrial operations. Ensuring the safety of process equipment—from design through operation—requires a proactive approach to hazard identification, risk mitigation, and compliance with industry standards.

This 3-day course provides engineers and safety professionals with practical strategies and tools for integrating safety principles into the design, specification, and operation of process equipment. Participants will explore design codes, safety devices, failure analysis, and operational safeguards to ensure safe, compliant, and reliable systems.

Objectives

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

- Apply key process safety principles to equipment design and operation
- Recognize common hazards in pressure systems, vessels, piping, and rotating equipment
- Evaluate equipment safety using applicable codes (ASME, API, IEC)
- Design and assess protective systems such as pressure relief devices and interlocks
- Improve operational procedures and inspection programs for safety assurance

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Why Attend

- Bridge the gap between engineering design and operational safety
- Strengthen compliance with global safety standards and codes
- Reduce the likelihood of equipment-related process incidents
- Gain technical insight into design reviews, HAZOP, and LOPA
- Learn from real-life industry incidents and failure analyses

Target Audience

This program is designed for:

- Process, mechanical, and piping engineers
- Health, safety, and environmental (HSE) professionals
- Maintenance and operations personnel
- Engineering consultants and EPC contractors
- Regulators and plant inspectors

Individual Benefits

Key competencies that will be developed include:

- Equipment hazard recognition and risk evaluation
- Understanding of safety design standards and codes
- Proficiency in applying protective design techniques
- Familiarity with safety instrumented systems and relief device selection
- Enhanced decision-making for equipment integrity and safety

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Improved plant reliability and process integrity
- Enhanced safety in equipment design, selection, and operation
- Greater alignment with regulatory and client safety expectations
- Reduced unplanned downtime and incident costs
- Stronger safety culture across engineering and operations teams

Instructional Methodology

The course follows a blended learning approach combining theory with practice:

- Strategy Briefings – Design codes, equipment safety principles, and industry best practices
- Case Studies – Analysis of equipment-related accidents and safety violations
- Workshops – Hazard identification, design checklists, and protective system design
- Peer Exchange – Group discussion of safety dilemmas and lessons learned
- Tools – Design review templates, risk matrices, inspection checklists, and API/ASME references

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Course Outline

DETAILED 3-DAY COURSE OUTLINE

Training Hours: 7:30 AM – 3:30 PM Daily Format: 3 Learning Modules | Coffee Breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Safety-Centered Design of Process Equipment

- Module 1: Safety Principles in Equipment Design (07:30 – 09:30) • Inherently safer design concepts • Lifecycle approach to equipment safety • Design interface with risk management
- Module 2: Pressure Equipment and Containment Integrity (09:45 – 11:15) • Pressure vessels, heat exchangers, and piping hazards • Design codes: ASME Section VIII, B31.3, API 510 • Material selection, fabrication, and inspection considerations
- Module 3: Protective Systems and Relief Devices (11:30 – 01:00) • Sizing and selection of pressure relief valves • Rupture disks, PSV vs. PRD applications • Case examples of relief device failures
- Workshop – Equipment Hazard Mapping (02:00 – 03:30) • Hazard identification for plant assets • Criticality and risk ranking

Day 2: Safety in Operation, Controls, and Maintenance

- Module 1: Safety Instrumented Systems (SIS) (07:30 – 09:30) • IEC 61511 and safety integrity levels (SIL) • Logic solvers, sensors, and final control elements • Functional safety lifecycle and testing
- Module 2: Operational Safety and Maintenance (09:45 – 11:15) • Operating procedures and safe startup/shutdown practices • Equipment monitoring and inspection strategies • Maintenance planning for safety-critical assets
- Module 3: Equipment Failure Modes and Prevention (11:30 – 01:00) • Corrosion, fatigue, creep, and overpressure • Root cause and failure mode analysis (FMEA) • Integrity operating windows and alarms
- Workshop – Safety Review of Operating Scenarios (02:00 – 03:30) • Fault scenarios and response planning • Team discussion on alarm setting and operator response

Day 3: Advanced Techniques and Safety Management Integration

- Module 1: Hazard and Operability Studies (HAZOP) (07:30 – 09:30) • Structuring and facilitating HAZOPs • Node definition and guideword analysis • Interfacing HAZOP with P&IDs and design teams
- Module 2: Layers of Protection Analysis (LOPA) (09:45 – 11:15) • Understanding independent protection layers • Probability of failure and initiating events • Linking LOPA to SIS and relief systems
- Module 3: Audit, Documentation, and Regulatory Compliance (11:30 – 01:00) • Inspection and audit preparation • Documentation: PSSR, MOC, and compliance tracking • Regulatory expectations and best practices
- Final Workshop – Risk Reduction Plan (02:00 – 03:30) • Group project on a plant scenario • Presenting risk controls and safety improvements

Certification

Participants will receive a Certificate of Completion in Safety in Process Equipment Design & Operation, validating their ability to apply engineering and operational safety practices in the design, review, and maintenance of process equipment in line with international safety standards.

Why Choose MAWA Events

- **Global Expertise:** More than 17 years of experience in professional training and consulting.
- **Industry-Leading Faculty:** Courses delivered by seasoned professionals with hands-on experience.
- **Practical Insights:** Learn to turn theory into actionable strategies for real-world business impact.
- **Client-Focused Solutions:** Customized programs designed to achieve your organisation’s unique goals.

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