

## SAFETY IN PROCESS DESIGN MASTERCLASS

*“Engineering Safer Process Systems Through Hazard Elimination, Mitigation, and Risk-Based Design”*

### Schedule

Date	Venue	Fees
12 - 14 May 2026	Doha, Qatar	USD 2495 per delegate
24 - 26 Aug 2026	Dubai, UAE	USD 2495 per delegate
24 - 26 Nov 2026	Manama, Bahrain	USD 2495 per delegate

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

### Introduction

Safety in process design is a critical discipline that ensures hazardous events are anticipated and addressed at the earliest stages of engineering. With increasing pressure from regulators, insurers, and the public, organizations must adopt inherently safer design philosophies and ensure process systems are structured to prevent, contain, or safely manage risks.

This intensive masterclass provides participants with the principles, tools, and methodologies required to incorporate safety into process design decisions. Covering hazard identification, risk analysis, equipment layout, and inherently safer design, the course bridges the gap between theory and practice for engineers and safety professionals working in high-risk industries.

### Objectives

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

- Integrate safety principles into the process design lifecycle
- Apply hazard identification and risk assessment tools (HAZID, HAZOP, LOPA)
- Design systems to mitigate fire, explosion, and toxic release risks
- Evaluate layouts, material choices, and process parameters for inherent safety
- Support regulatory compliance and safety case development through sound design

## Why Attend

- Embed safety as a core design criterion—not just an operational consideration
- Strengthen your understanding of hazard elimination vs. hazard control
- Comply with global standards including API, IEC 61511, OSHA PSM, and ISO 45001
- Reduce lifecycle costs and incidents through design risk minimization
- Support sustainability and resilience through safer technology selection

## Target Audience

This program is designed for:

- Process, mechanical, and chemical engineers
- Safety and loss prevention professionals
- Project design and engineering managers
- HSE officers and risk analysts
- Technical professionals involved in plant design, upgrades, or modifications

## Individual Benefits

Key competencies that will be developed include:

- Hazard identification and consequence modeling
- Application of risk reduction layers and safety instrumented systems
- Knowledge of codes, guidelines, and design standards
- Ability to influence safety outcomes early in project planning
- Improved collaboration with multi-disciplinary engineering and HSE teams

## Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Reduced process safety incidents and engineering design rework
- Enhanced compliance with design safety regulations and audits
- Optimized equipment layout and siting to minimize risk
- More efficient design reviews with safety integrated upfront
- Improved process design culture aligned with corporate safety goals

## Instructional Methodology

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

- Strategy Briefings - Codes, standards, and design safety frameworks
- Case Studies - Notable design failures and lessons learned
- Workshops - P&ID reviews, hazard studies, and mitigation planning
- Peer Exchange - Cross-sector discussion of best practices and innovations
- Tools - Checklists, bowtie diagrams, design safety matrices, and risk registers

## Course Outline

Detailed 3-Day Course Outline

**Training Hours:** 7:30 AM – 3:30 PM **Daily Format:** 3–4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

### Day 1: Foundations of Process Safety in Design

- Module 1: Introduction to Inherently Safer Design (07:30 – 09:30) • Principles: minimization, substitution, moderation, and simplification
- Module 2: Process Hazard Identification Methods (09:45 – 11:15) • HAZID, HAZOP, and qualitative risk analysis tools
- Module 3: Workshop – Conducting a HAZID on a Sample System (11:30 – 01:00) • Hands-on identification of major hazards in a simplified PFD
- Module 4: Peer Exchange – Experiences with Design-Stage Safety Gaps (02:00 – 03:30) • Group discussion on real design oversight incidents

### Day 2: Risk Assessment and Mitigation Design

- Module 5: Layers of Protection Analysis (LOPA) (07:30 – 09:30) • Independent protection layers, initiating events, and safety integrity
- Module 6: Fire, Explosion, and Toxic Risk Design Strategies (09:45 – 11:15) • Siting, containment, dispersion modeling, and passive protection
- Module 7: Workshop – Bowtie Diagram for Explosion Scenario (11:30 – 01:00) • Map threats, consequences, barriers, and escalation controls
- Module 8: Case Study – Bhopal and Piper Alpha (02:00 – 03:30) • Analyze historic design failures and lessons for modern practice

### Day 3: Safety Integration and Design Verification

- Module 9: Layout, Spacing, and Material Compatibility (07:30 – 09:30) • Facility siting, toxic zone definition, and hazardous area classification
- Module 10: Safety Instrumented Systems and Controls (09:45 – 11:15) • Designing SIS under IEC 61511 and alarm management
- Module 11: Workshop – Design Safety Review Simulation (11:30 – 01:00) • Perform a multidisciplinary review of a mock plant design
- Module 12: Wrap-Up, Feedback, and Certification (02:00 – 03:30) • Summary, Q&A, and certificate awarding

## Certification

Participants will receive a Certificate of Completion in Safety in Process Design Masterclass, validating their knowledge and skills in applying safety principles across the process design lifecycle in alignment with international best practices.

## Why Choose MAWA Events

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### In-House / Customized Training

Interested in running this course for your team?

Please contact us:

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