MAWA EVENTS

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

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

INNOVATIVE PROCESS PIPE DESIGN AND MAINTENANCE STRATEGIES

"Optimizing pipeline performance through smart design, inspection, and proactive maintenance techniques."

Schedule

Date	Venue	Fees (Face-to-Face)
07 – 11 Sep 2026	London, UK	USD 3,495 per delegate

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

Introduction

Piping systems form the backbone of every process facility in oil & gas, petrochemicals, power generation, water treatment, and other industries. Inefficient design or poor maintenance can result in flow problems, leaks, corrosion, downtime, and safety hazards. This course addresses modern approaches to process piping design and introduces innovative maintenance practices that ensure system reliability, compliance, and longevity.

This 5-day intensive training covers best practices in layout, material selection, stress analysis, failure prevention, inspection techniques, and lifecycle optimization. Participants will learn to assess piping integrity and apply standards such as ASME B31.3 and API 570 to ensure operational safety and performance.

Objectives

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

- Design efficient and code-compliant process piping systems
- Select appropriate piping materials for various process conditions
- Identify stress factors and apply basic pipe stress analysis
- Understand failure mechanisms such as corrosion, fatigue, and erosion
- Implement proactive inspection, monitoring, and maintenance plans
- Align designs and maintenance strategies with international codes and standards

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Why Attend

- Minimize risk of leaks, downtime, and catastrophic failure
- Enhance safety and compliance with global piping codes
- Improve system design for flow efficiency and durability
- Learn modern inspection methods and failure prevention techniques
- Get hands-on with case studies and real plant applications

Target Audience

This program is designed for:

- Mechanical, piping, and process engineers
- Maintenance and reliability engineers
- Engineering design and drafting personnel
- Project managers and construction supervisors
- QA/QC inspectors and field engineers
- Plant engineers and technical consultants

Individual Benefits

Key competencies that will be developed include:

- Process piping layout and component design
- Pipe material selection and rating
- Piping support design and vibration control
- Application of piping codes and standards
- Maintenance planning and inspection techniques

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Improved piping reliability and integrity
- Lower maintenance costs and downtime
- Safer operations and regulatory compliance
- Better project outcomes through efficient design
- Enhanced capability in failure prediction and root cause analysis

Instructional Methodology

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

- Strategy Briefings – Codes, standards, piping materials, and system design
- Case Studies – Real failures, maintenance issues, and design corrections
- Workshops – Layout optimization, pipe stress checks, and material selection
- Peer Exchange – Team-based failure analysis and inspection strategy development
- Tools – Piping isometric review templates, inspection forms, and risk-ranking matrices

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Course Outline

Detailed 5-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: Fundamentals of Process Piping Design

- Module 1: Piping System Components and Configurations (07:30 – 09:30)
- Valves, fittings, flanges, gaskets, and supports
- P&IDs and piping isometric basics
- Module 2: Introduction to ASME B31.3 and Piping Standards
- Code scope, material specs, and classification
- Module 3: Process Flow and Layout Design
- Pipe routing, spacing, slope, and expansion loops

Day 2: Materials, Stress and Flexibility

- Module 1: Piping Materials and Corrosion Resistance
- Carbon steel, stainless, duplex, plastic, and lined piping
- Module 2: Pipe Stress Factors and Thermal Expansion
- Basics of stress analysis and flexibility considerations
- Module 3: Vibration, Fatigue and Support Design
- Pipe hangers, anchors, and restraints

Day 3: Common Failures and Prevention

- Module 1: Piping Failure Mechanisms
- Corrosion, erosion, water hammer, and gasket failures
- Module 2: Root Cause Analysis Techniques
- FMEA, 5-Whys, fault tree and fishbone diagrams
- Module 3: Case Study – Pipeline Rupture Due to Misalignment

Day 4: Inspection, Monitoring, and Repairs

- Module 1: Visual and NDT Inspection Methods
- UT, radiography, hydrotesting, thermography
- Module 2: Integrity Monitoring and Risk-Based Inspection (RBI)
- API 570 and RBI application
- Module 3: Repair and Replacement Techniques
- In-service repair methods, hot tapping, pipe clamping

Day 5: Optimization and Maintenance Planning

- Module 1: Maintenance Strategy for Process Piping
- Preventive, predictive, and condition-based approaches
- Module 2: Life Cycle Costing and System Optimization
- Energy efficiency and material lifecycle economics
- Module 3: Group Workshop – Design Review and Maintenance Plan
- Team activity to evaluate a piping system case and develop a maintenance strategy

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Certification

Participants will receive a Certificate of Completion in Innovative Process Pipe Design and Maintenance Strategies, validating their ability to design, assess, and maintain piping systems in accordance with international 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.

In-House / Customized Training Interested in running this course for your team? Please contact us:	TEL: **+601116373203**	EMAIL: **info@mawaevents.net**