MAWA EVENTS

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

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PIPING SYSTEM FUNDAMENTALS - DESIGN, OPERATION & MAINTENANCE

"Mastering the Key Aspects of Piping System Design, Operation, and Maintenance for Optimal Performance"

Schedule

Date	Venue	Fees (Face-to-Face)
16 – 20 Aug 2026	Manama, Bahrain	USD 3,495 per delegate
13 – 17 Sep 2026	Manama, Bahrain	USD 3,495 per delegate

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

Introduction

Piping systems are a crucial part of industrial infrastructure, used in various industries such as oil and gas, chemical processing, power generation, and manufacturing. Understanding the fundamentals of piping system design, operation, and maintenance is essential for ensuring safe, reliable, and efficient system performance. This 5-day intensive course covers the critical aspects of piping systems, from design principles to maintenance strategies, providing participants with the skills needed to improve system performance and troubleshoot common issues.

The course will focus on piping system design, material selection, fluid flow considerations, pressure and temperature control, and preventive maintenance practices. Participants will also gain insights into key regulatory standards and safety considerations that apply to piping systems.

Objectives

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

- Understand the fundamental principles of piping system design and operation
- Select appropriate materials for different piping system applications
- Design piping systems considering fluid flow, pressure, temperature, and safety regulations
- Implement preventive and corrective maintenance strategies to enhance piping system performance
- Troubleshoot common piping system issues and resolve operational challenges efficiently

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Why Attend

- Gain comprehensive knowledge of piping system design, operation, and maintenance
- Learn how to select and use the right materials and components for piping systems
- Enhance your troubleshooting skills and improve your ability to address common piping issues
- Understand the key factors that affect piping system performance, including fluid dynamics and heat transfer
- Develop an effective maintenance plan to maximize the reliability and lifespan of piping systems

Target Audience

This program is designed for:

- Engineers and technicians involved in the design, operation, and maintenance of piping systems
- Maintenance managers, supervisors, and engineers responsible for piping system performance
- Project managers and design engineers in industries such as oil and gas, chemical processing, and manufacturing
- Anyone interested in improving their understanding of piping system fundamentals and their role in industrial operations

Individual Benefits

Key competencies that will be developed include:

- Expertise in designing and maintaining piping systems for various industrial applications
- Knowledge of fluid dynamics, pressure and temperature control in piping systems
- The ability to choose appropriate materials for different piping systems
- Advanced troubleshooting and diagnostic skills for piping system issues
- A better understanding of the regulatory standards and safety considerations in piping system operations

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Enhanced ability to design and operate piping systems that meet safety and efficiency standards
- Improved system reliability, reduced downtime, and fewer unplanned maintenance events
- Better resource management in piping system operations, leading to cost savings
- Increased compliance with industry standards and regulations
- A more skilled workforce capable of identifying, troubleshooting, and solving piping system issues efficiently

Instructional Methodology

The course follows a blended learning approach combining theory with practical application:

- Strategy Briefings – Detailed explanation of piping system design, materials, and maintenance principles
- Case Studies – Real-world examples of piping system operations and maintenance practices
- Workshops – Hands-on exercises to practice designing and maintaining piping systems
- Peer Exchange – Group discussions and knowledge sharing on best practices in piping system management
- Tools – Templates, checklists, and diagnostic tools for designing and maintaining piping systems

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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: Introduction to Piping Systems Design

- Module 1: Piping System Fundamentals (07:30 – 09:30) • Basic principles of piping systems and their role in industrial operations • Types of piping systems: transportation, distribution, and process piping • Key components: pipes, valves, pumps, and fittings
- Module 2: Fluid Flow and Pressure Considerations (09:45 – 11:15) • Fluid dynamics and factors affecting flow in pipes • Pressure drop, temperature, and velocity considerations in piping systems • Understanding Bernoulli\'s principle and its application in pipe design
- Module 3: Material Selection for Piping Systems (11:30 – 01:00) • Types of materials used in piping systems: metals, plastics, composites • Material selection based on fluid type, temperature, pressure, and environment • Corrosion resistance and its importance in material selection
- Workshop – Piping System Design Exercise (02:00 – 03:30) • Hands-on design exercise: selecting materials and designing a simple piping system • Group discussion and feedback

Day 2: Piping System Operations and Controls

- Module 1: Piping System Pressure and Temperature Control (07:30 – 09:30) • Techniques for controlling pressure and temperature in piping systems • Types of valves and their role in system control • Pressure relief valves, control valves, and their applications
- Module 2: Flow Metering and Monitoring (09:45 – 11:15) • Measuring and monitoring flow in piping systems • Types of flow meters and their applications • Strategies for maintaining accurate flow measurements and monitoring system performance
- Module 3: Piping System Safety and Standards (11:30 – 01:00) • Safety considerations in piping system operation • Industry standards and codes (ASME, API, ASME B31.3) • Maintaining system integrity and preventing accidents
- Workshop – Pressure and Flow Control (02:00 – 03:30) • Practical exercise on designing control systems for a piping system • Group feedback on the control strategies used in the exercise

Day 3: Maintenance Strategies for Piping Systems

- Module 1: Preventive Maintenance for Piping Systems (07:30 – 09:30) • Developing a preventive maintenance program for piping systems • Inspection and monitoring techniques for identifying issues early • Maintaining valves, seals, and pumps in piping systems
- Module 2: Troubleshooting Common Piping System Issues (09:45 – 11:15) • Identifying and resolving common problems in piping systems: leaks, corrosion, blockages • Troubleshooting methods for resolving flow issues and pressure drops • Managing wear and tear of pipes and valves
- Module 3: Repair and Restoration of Piping Systems (11:30 – 01:00) • Techniques for repairing and restoring damaged piping systems • Replacement and upgrading of key components • Best practices for welding and fitting in maintenance
- Workshop – Troubleshooting Exercise (02:00 – 03:30) • Hands-on practice troubleshooting common piping system issues • Group collaboration on real-world troubleshooting scenarios

Day 4: Advanced Topics in Piping Systems

- Module 1: Piping System Design for Complex Applications (07:30 – 09:30) • Designing piping systems for high-pressure and high-temperature applications • Multi-phase flow and complex fluid dynamics in piping systems • Integrating safety measures into complex piping system designs
- Module 2: Leak Detection and Control (09:45 – 11:15) • Methods for detecting and preventing leaks in piping systems • Technologies for leak detection: acoustic, thermal, and pressure sensors • Strategies for controlling and managing leaks
- Module 3: Piping System Integrity and Life Extension (11:30 – 01:00) • Techniques for maintaining and extending the life of piping systems • Corrosion prevention and mitigation strategies • Condition-based monitoring and predictive maintenance

- Workshop – Complex System Design and Leak Control (02:00 – 03:30) • Design a complex piping system and implement leak detection strategies • Group presentations and feedback

Day 5: Final Review and Certification Preparation

- Module 1: Reviewing Piping System Design and Maintenance (07:30 – 09:30) • Review of key concepts in piping system design, operation, and maintenance • Identifying challenges and solutions in piping system management • Discussing trends and innovations in piping systems
- Module 2: Certification Preparation and Final Review (09:45 – 11:15) • Preparing for the final assessment • Recap of key learning points and takeaways from the course
- Final Workshop – Piping System Action Plan (02:00 – 03:30) • Develop a piping system maintenance and optimization action plan for your organization • Group review and feedback

Certification

Participants will receive a Certificate of Completion in Piping System Fundamentals - Design, Operation & Maintenance, validating their expertise in optimizing piping system design, operation, and maintenance for improved performance and efficiency.

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**