MAWA EVENTS

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

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

MECHANICAL SEALS – API PIPING PLANS

"Master API Standards and Optimize Mechanical Seal Reliability in Rotating Equipment"

Schedule

Date	Venue	Fees (Face-to-Face)
10 – 14 Aug 2026	London, UK	USD 3495 per delegate

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

Introduction

Mechanical seals are critical components in rotating equipment, preventing fluid leakage, maintaining pressure integrity, and ensuring equipment longevity. Improper selection, installation, or operation can lead to frequent failures, increased downtime, and substantial maintenance costs.

This intensive 5-day course provides an in-depth understanding of mechanical seal types, design principles, and associated API piping plans. Participants will gain practical knowledge to ensure effective selection, installation, and troubleshooting of seals in accordance with API 682 and related international standards.

Objectives

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

- Understand mechanical seal fundamentals and classifications
- Apply API 682 seal arrangements and piping plans for various applications
- Identify failure causes and implement effective troubleshooting techniques
- Select appropriate seals based on process conditions and operational requirements
- Enhance equipment reliability and reduce leakage incidents through optimized seal management

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Why Attend

- Deepen your understanding of seal technology and operational dynamics
- Master API 682 piping plans and seal support systems
- Improve plant reliability through effective seal maintenance strategies
- Gain hands-on experience in seal failure analysis and system design
- Enhance your technical decision-making with practical tools and standards

Target Audience

This program is designed for:

- Mechanical and reliability engineers
- Maintenance and rotating equipment technicians
- Process and operations engineers
- Technical supervisors and engineering managers
- Asset integrity and plant reliability professionals

Individual Benefits

Key competencies that will be developed include:

- Practical understanding of mechanical seal operation and installation
- Ability to interpret and implement API 682 piping plans
- Skills to troubleshoot seal failures and apply corrective actions
- Familiarity with seal material compatibility and selection criteria
- Competence in improving MTBF (mean time between failure) through proactive seal management

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Enhanced ability to reduce downtime from seal-related failures
- Improved safety through reliable sealing in high-pressure and hazardous applications
- Increased efficiency in maintenance practices and asset management
- Stronger compliance with API and international mechanical seal standards
- Optimized lifecycle cost of rotating equipment through better seal selection and application

Instructional Methodology

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

- Strategy Briefings – Deep dive into seal fundamentals, API standards, and system design
- Case Studies – Analysis of real-world seal failures and operational scenarios
- Workshops – Hands-on tasks involving piping plan design, seal selection, and troubleshooting
- Peer Exchange – Technical group discussions on sealing challenges across industries
- Tools – Reference charts, piping plan diagrams, failure analysis templates, and inspection checklists
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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 Mechanical Seals and Their Applications

- Module 1: Fundamentals of Mechanical Seals (07:30 – 09:30)
- Types and functions of mechanical seals
- Sealing principles and leakage control
- Factors influencing seal performance
- Module 2: Seal Components and Materials (09:45 – 11:15)
- Primary and secondary sealing elements
- Materials of construction and compatibility
- Wear, corrosion, and thermal considerations
- Module 3: Seal Selection Criteria (11:30 – 01:00)
- Process conditions, media, pressure, and temperature
- Seal environments and classification
- API 682 seal types and arrangement selection
- Module 4: Workshop – Seal Identification and Application (02:00 – 03:30)
- Seal configuration analysis
- Identifying failures based on operational context
- Application-based seal selection practice

Day 2: API 682 and Piping Plan Fundamentals

- Module 1: Introduction to API 682 (07:30 – 09:30)
- Overview and structure of API 682 standard
- Seal categories, types, and arrangement nomenclature
- Evolution and importance of the standard
- Module 2: Piping Plan Concepts (09:45 – 11:15)
- Purpose and principles of seal support systems
- Plan selection for single and dual seals
- Flow, pressure control, and cooling mechanisms
- Module 3: Group 1, 2, and 3 Seals in API 682 (11:30 – 01:00)
- Process examples and requirements per group
- Seal face technologies and configurations
- Troubleshooting issues specific to each group
- Module 4: Case Study – Piping Plan Failures and Root Causes (02:00 – 03:30)
- Reviewing failed plans and improper designs
- Lessons learned and best practices
- Group problem-solving and reporting

Day 3: API Piping Plans – Detailed Application

- Module 1: API Piping Plans for Single Seals (07:30 – 09:30)
- Plans 01, 02, 11, 13, 14
- Application scenarios, installation, and monitoring
- Flow paths and heat dissipation techniques
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Module 2: API Piping Plans for Dual Unpressurized Seals (09:45 – 11:15)

- Plans 52, 53A/B/C – Functionality and configurations
- Fluid reservoirs, pressure control, and instrumentation
- Troubleshooting unpressurized system failures
- Module 3: API Piping Plans for Dual Pressurized Seals (11:30 – 01:00)
- Plans 54, 55 – External systems and control strategies
- Typical equipment interfaces
- Risk and safety implications
- Module 4: Workshop – Developing a Piping Plan for a Case Process (02:00 – 03:30)
- Scenario-based plan selection
- Creating a functional and reliable support system
- Team presentations and review

Day 4: Installation, Operation, and Troubleshooting

- Module 1: Seal Installation Techniques (07:30 – 09:30)
- Best practices for installation and handling
- Startup procedures and alignment
- Commissioning checks
- Module 2: Troubleshooting and Failure Modes (09:45 – 11:15)
- Common seal failure causes
- Interpreting wear patterns and failure analysis
- Preventive maintenance strategies
- Module 3: Seal Monitoring and Maintenance (11:30 – 01:00)
- Condition monitoring tools
- Preventive and predictive maintenance
- Maintenance schedules and documentation
- Module 4: Case Study – Troubleshooting a Seal System (02:00 – 03:30)
- Fault identification in a dual seal setup
- Root cause analysis methodology
- Actionable solutions

Day 5: System Optimization and Reliability Engineering

- Module 1: Improving Seal Reliability (07:30 – 09:30)
- MTBF and reliability metrics
- Proactive strategies for longer seal life
- Engineering for operational excellence
- Module 2: Seal System Upgrades and Modifications (09:45 – 11:15)
- Retrofitting legacy systems
- Cost-effective upgrades aligned with API standards
- Vendor collaboration and specification management
- Module 3: Reliability Case Studies (11:30 – 01:00)
- Lessons from high-reliability sealing programs
- Industry benchmarks and ROI insights
- Integrated seal management systems
- Module 4: Final Review and Certification (02:00 – 03:30)

Course review and Q&A

- Participant action planning for workplace application
- Training feedback and certificate distribution

Certification

Participants will receive a Certificate of Completion in Mechanical Seals & API Piping Plans, validating their expertise in selecting, applying, and managing mechanical seals and support systems according to API 682 and industry best practices.

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**