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 TROUBLESHOOTING

""Improving Equipment Reliability by Solving Seal Failures and Enhancing Seal Performance""

Schedule

Date	Venue	Fees (Face-to-Face)
08 – 12 Feb 2026	Manama, Bahrain	USD 3495 per delegate

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

Introduction

Mechanical seals are critical components in rotating equipment such as pumps, compressors, and mixers, directly affecting equipment reliability, safety, and operational efficiency. Failures in seal systems can lead to unscheduled shutdowns, product loss, and increased maintenance costs.

This comprehensive five-day training course is designed to provide participants with the knowledge and skills required to troubleshoot, analyze, and prevent mechanical seal failures. It focuses on seal types, installation practices, failure modes, material compatibility, and maintenance strategies. Participants will learn how to interpret failure symptoms, implement corrective actions, and extend seal life in a range of industrial applications.

Objectives

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

- Understand the function, design, and classification of mechanical seals
- Identify the root causes of common seal failures and performance issues
- Apply best practices for seal installation, inspection, and maintenance
- Evaluate seal operating conditions and material compatibility
- Troubleshoot dynamic sealing systems and recommend corrective actions

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Why Attend

- Minimize costly seal-related equipment downtime
- Learn to identify early warning signs of seal failure
- Strengthen maintenance team capability in seal diagnosis and repair
- Reduce seal inventory and maintenance costs through better reliability
- Ensure compliance with industry standards and safety protocols

Target Audience

This program is designed for:

- Mechanical, maintenance, and reliability engineers
- Rotating equipment specialists and plant technicians
- Maintenance supervisors and operations personnel
- Technical inspectors and failure analysts
- Anyone responsible for pump or seal system performance

Individual Benefits

Key competencies that will be developed include:

- Seal system troubleshooting and root cause analysis
- Knowledge of seal types, materials, and design principles
- Seal installation and failure prevention techniques
- Vibration, temperature, and leakage monitoring
- Effective communication with OEMs and seal vendors

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Lower seal failure rates and increased equipment uptime
- Better failure analysis and reporting procedures
- Improved compliance with mechanical integrity standards
- More effective planning and coordination of seal maintenance tasks
- Cost savings through extended seal and equipment life

Instructional Methodology

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

- Strategy Briefings – Core principles of sealing, materials, and design standards
- Case Studies – Analysis of real-world seal failures and recovery actions
- Workshops – Hands-on troubleshooting, seal identification, and performance review
- Peer Exchange – Interactive discussion of plant-specific challenges
- Tools – Failure log templates, seal installation checklists, and inspection forms

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Course Outline

Detailed 5-Day Course Outline

Training Hours: 07:30 AM – 3:30 PM **Daily Format:** 3–4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Seal Fundamentals and Applications

- Module 1: Mechanical Seal Basics (07:30 – 09:30) • Purpose and function of mechanical seals • Seal types: single, double, tandem, cartridge, pusher, non-pusher • Differences between seals and packing systems
- Module 2: Components and Seal Design Features (09:45 – 11:15) • Seal faces, springs, elastomers, and gland plates • Seal chamber types and pressure balancing • API 682 overview and classifications
- Module 3: Seal Selection and Operating Environment (11:30 – 01:00) • Pressure, temperature, fluid type, and speed considerations • Material compatibility and environmental control • Seal piping plans (API Plans 11, 21, 23, etc.)
- Module 4: Workshop – Identifying Seal Types and Functions (02:00 – 03:30) • Group activity examining common seal designs

Day 2: Seal Failure Mechanisms and Root Cause Analysis

- Module 1: Common Mechanical Seal Failures (07:30 – 09:30) • Leakage, thermal distortion, face wear, scoring, and fretting • Elastomer degradation, clogging, and dry running • Seal degradation vs. system failure
- Module 2: Diagnosing Seal Problems (09:45 – 11:15) • Symptoms: vibration, temperature rise, leakage patterns • Inspection techniques and reporting • Linking symptoms to failure causes
- Module 3: RCA Methodologies for Seal Failures (11:30 – 01:00) • Using 5 Whys, Fishbone diagrams, and Failure Modes Analysis • Seal failure investigation process and evidence gathering • Real-life failure scenario review
- Module 4: Workshop – Seal Failure Diagnosis Exercise (02:00 – 03:30) • Hands-on case analysis using real inspection data

Day 3: Seal Installation and Maintenance Best Practices

- Module 1: Correct Seal Installation Procedures (07:30 – 09:30) • Handling and alignment techniques • Torque specifications and setting axial clearance • Common installation mistakes and how to avoid them
- Module 2: Seal Start-Up and Shutdown Considerations (09:45 – 11:15) • Priming systems and dry-run prevention • Seal warm-up and process fluid preparation • Flushing and cooling system checks
- Module 3: Inspection and Maintenance Practices (11:30 – 01:00) • Routine inspection intervals and what to check • Seal flush plans and support system maintenance • Spare part inventory management
- Module 4: Workshop – Seal Installation Walkthrough (02:00 – 03:30) • Demonstration and discussion of field procedures

Day 4: System Troubleshooting and Process Interaction

- Module 1: Process and Equipment Impact on Seals (07:30 – 09:30) • Pump operation and seal life correlation • Process upset conditions: cavitation, flashing, and vibration • Misalignment, bearing wear, and piping stress
- Module 2: Vibration and Temperature Diagnostics (09:45 – 11:15) • Monitoring tools and interpretation • Case examples: vibration patterns related to seal wear • Predictive maintenance strategies
- Module 3: Seal Support Systems and Piping Plans (11:30 – 01:00) • Plan functions and design selection • Plan operation, instrumentation, and failures • Troubleshooting piping system faults
- Module 4: Case Study – System-Level Seal Failure (02:00 – 03:30) • Review of process-related seal degradation • Prevention strategies and corrective actions

Day 5: Seal Reliability and Continuous Improvement

- Module 1: Improving Seal Performance and MTBF (07:30 – 09:30) • Seal life cycle management • Aligning seal selection with asset strategy • Reliability-centered maintenance for sealing systems
- Module 2: Vendor Management and Specification (09:45 – 11:15) • Working with OEMs and suppliers • Technical evaluation of vendor proposals • Standardizing specifications and documentation

- Module 3: Final Review and Troubleshooting Simulation (11:30 – 01:00) • Integrated troubleshooting activity • Course summary and action planning
- Module 4: Certification and Wrap-Up (02:00 – 03:30) • Q&A session • Distribution of certificates • Participant feedback

Certification

Participants will receive a Certificate of Completion in Mechanical Seals Troubleshooting, validating their technical competence in diagnosing seal failures, applying best maintenance practices, and enhancing the performance and reliability of dynamic sealing systems.

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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