MAWA EVENTS

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

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ADVANCED PUMP TECHNOLOGIES: MAINTENANCE AND TROUBLESHOOTING MASTERY

"Maximizing Pump Reliability and Performance through Engineering Excellence"

Schedule

Date	Venue	Fees (Face-to-Face)
14 – 18 Sep 2026	London – UK	USD 3495 per delegate

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

Introduction

Pumps are critical assets in industrial operations, yet they are also among the most common sources of inefficiencies, failures, and downtime. Understanding advanced pump technologies, failure modes, and troubleshooting techniques is essential for maximizing equipment reliability and minimizing maintenance costs.

This 5-day intensive training provides in-depth knowledge of pump design, performance analysis, failure diagnostics, and predictive maintenance. Participants will gain hands-on skills to identify root causes of malfunctions, implement condition-based strategies, and enhance the reliability of centrifugal and positive displacement pumps.

Objectives

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

- Analyze the working principles and components of various pump types
- Apply advanced techniques for troubleshooting and failure prevention
- Interpret vibration, temperature, and pressure diagnostics for pumps
- Implement predictive and preventive maintenance strategies
- Improve pump performance, energy efficiency, and lifecycle management

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Why Attend

- Develop technical mastery in pump operation, monitoring, and maintenance
- Learn root cause analysis techniques specific to pump failure modes
- Gain exposure to vibration analysis, alignment, and seal system optimization
- Explore energy-saving and performance enhancement strategies
- Engage with real-life case studies, failure reports, and troubleshooting labs

Target Audience

This program is designed for:

- Mechanical maintenance engineers and pump technicians
- Reliability and asset integrity engineers
- Process and operations personnel involved in rotating equipment
- Plant supervisors and utility maintenance staff
- Engineering consultants and project managers

Individual Benefits

Key competencies that will be developed include:

- Advanced understanding of centrifugal and positive displacement pump systems
- Troubleshooting skills for mechanical, hydraulic, and operational issues
- Competence in vibration monitoring, alignment, and seal troubleshooting
- Ability to implement condition-based and predictive maintenance programs
- Knowledge of standards and best practices in pump maintenance

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Increased equipment availability and reduced unplanned downtime
- Improved reliability of pumping systems and reduced maintenance costs
- Enhanced energy efficiency and operational safety
- Data-driven decision-making for maintenance planning
- Stronger maintenance teams equipped with practical troubleshooting tools

Instructional Methodology

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

- Strategy Briefings – In-depth sessions on pump types, design, performance, and diagnostics
- Case Studies – Real-world breakdowns and troubleshooting reports
- Workshops – Practical exercises on pump alignment, seal inspection, and failure diagnosis
- Peer Exchange – Interactive discussions on field challenges and resolution strategies
- Tools – Checklists, diagnostic charts, and maintenance planning templates

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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: Pump Fundamentals and Classification

- Module 1: Introduction to Pump Technology (07:30 – 09:30) • Overview of pump applications in industrial systems • Classification: centrifugal, positive displacement, and specialty pumps • Pump selection criteria and system integration basics
- Module 2: Pump Components and Design (09:45 – 11:15) • Impellers, casings, shafts, bearings, and seals • Material selection and design considerations • Pump curves and performance parameters
- Module 3: Operating Principles and Performance Metrics (11:30 – 01:00) • Flow rate, head, efficiency, and NPSH • Affinity laws and performance adjustments • Cavitation – causes, effects, and prevention
- Module 4: Workshop – Pump Curve Interpretation (02:00 – 03:30) • Reading and plotting pump curves • Matching pumps to system requirements • Practical exercises

Day 2: Maintenance and Monitoring Best Practices

- Module 1: Preventive and Predictive Maintenance (07:30 – 09:30) • Maintenance strategies and schedules • Predictive techniques: vibration, thermography, oil analysis • Criticality assessment of pumping systems
- Module 2: Lubrication and Bearing Management (09:45 – 11:15) • Types of bearings and failure modes • Lubrication types, intervals, and contamination control • Bearing condition monitoring
- Module 3: Mechanical Seal Systems (11:30 – 01:00) • Seal types: gland packing, mechanical seals, seal-less systems • Causes of seal failures and troubleshooting techniques • Seal installation and maintenance
- Module 4: Workshop – Maintenance Planning (02:00 – 03:30) • Developing a preventive maintenance checklist • Failure history analysis • Planning condition-based tasks

Day 3: Troubleshooting and Root Cause Analysis

- Module 1: Diagnosing Pump Failures (07:30 – 09:30) • Common failure modes and symptoms • Hydraulic vs. mechanical vs. electrical issues • Troubleshooting tools and approaches
- Module 2: Vibration and Alignment Techniques (09:45 – 11:15) • Vibration signatures and diagnostic interpretation • Soft foot, misalignment, and imbalance • Laser alignment and dial indicator methods
- Module 3: Root Cause Analysis (11:30 – 01:00) • RCFA for pumps using fishbone and 5-Whys • Failure pattern recognition • Documenting and reporting RCA findings
- Module 4: Workshop – Vibration Data Interpretation (02:00 – 03:30) • Simulated vibration data sets • Diagnosing case study failures • Group review and feedback

Day 4: System Optimization and Energy Efficiency

- Module 1: Pump System Optimization (07:30 – 09:30) • System head curve analysis • Parallel vs. series operation • Variable frequency drives (VFDs) and control logic
- Module 2: Energy Saving Opportunities (09:45 – 11:15) • Identifying inefficient pumps • Pump retrofits and upgrades • Energy audits and savings calculations
- Module 3: Reliability-Centered Maintenance (RCM) for Pumps (11:30 – 01:00) • FMEA for pumping systems • Proactive maintenance planning • Critical spares management
- Module 4: Workshop – Energy Optimization Plan (02:00 – 03:30) • Creating a pump energy efficiency action plan • ROI and cost-benefit analysis • Team presentations

Day 5: Pump Installation, Commissioning, and Case Reviews

- Module 1: Pump Installation and Start-Up (07:30 – 09:30) • Installation checklists and alignment procedures • System flushing, priming, and venting • Commissioning and start-up protocols

- Module 2: Troubleshooting Case Studies (09:45 – 11:15) • In-depth analysis of real pump failures • Fault isolation methods • Lessons learned from incident reports
- Module 3: Technology Trends and Innovations (11:30 – 01:00) • Smart pumps and IIoT integration • Remote monitoring and diagnostics • New materials and seal-less designs
- Module 4: Final Assessment and Closing (02:00 – 03:30) • Final technical quiz and review • Action plans for implementation • Certification distribution and wrap-up

Certification

Participants will receive a Certificate of Completion in Advanced Pump Technologies: Maintenance and Troubleshooting, confirming their expertise in diagnosing, maintaining, and optimizing industrial pump systems for improved reliability and performance.

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**