

PUMP TYPES & MAINTENANCE

“Optimizing Pump Reliability Through Proper Selection, Operation, and Maintenance”

Schedule

Date	Venue	Fees (Face-to-Face)
15 - 19 Feb 2026	Manama, Bahrain	USD 3495 per delegate

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

Introduction

Pumps are critical components in virtually every industrial facility, responsible for the transfer of fluids across a wide range of applications. Improper pump selection, operation, or maintenance can result in frequent failures, inefficiencies, and increased energy consumption. Understanding the different pump types, their operational characteristics, and maintenance needs is essential for maintaining plant reliability and efficiency.

This five-day training course provides a comprehensive overview of pump types, performance principles, common failure modes, and effective maintenance practices. It equips participants with practical skills for troubleshooting, alignment, seal management, and performance monitoring to extend pump life and reduce downtime.

Objectives

- By the end of this course, participants will be able to:
- Differentiate between major types of industrial pumps and their applications
 - Understand pump performance curves and selection criteria
 - Identify common causes of pump failure and how to prevent them
 - Apply effective inspection, maintenance, and troubleshooting techniques
 - Ensure proper alignment, sealing, and lubrication practices for extended reliability

Why Attend

- Improve equipment uptime by mastering pump troubleshooting and failure prevention
- Select the right pump type for specific applications and operating conditions
- Reduce maintenance costs through proactive and predictive techniques
- Learn best practices for pump installation, commissioning, and alignment
- Enhance plant energy efficiency and equipment reliability

Target Audience

This program is designed for:

- Maintenance engineers and mechanical technicians
- Plant engineers and operations supervisors
- Reliability and rotating equipment engineers
- Maintenance planners and asset managers
- Anyone involved in pump inspection, operation, or repair

Individual Benefits

Key competencies that will be developed include:

- Identification and application of various pump technologies
- Performance analysis using head, flow, and efficiency curves
- Root cause diagnosis of pump issues (cavitation, vibration, seal failure)
- Preventive and predictive maintenance execution
- Pump alignment, balancing, and seal/lubrication management

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Improved mean time between failures (MTBF) of critical pumping equipment
- Reduction in pump-related downtime and energy consumption
- Greater accuracy in pump selection and sizing for new applications
- Standardized maintenance procedures across the facility
- Enhanced safety and operational reliability in fluid systems

Instructional Methodology

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

- Strategy Briefings – Principles of pump selection, performance, and reliability
- Case Studies – Analysis of pump failure incidents and corrective actions
- Workshops – Hands-on exercises for troubleshooting and performance evaluation
- Peer Exchange – Group dialogue and site-specific experience sharing
- Tools – Templates for inspection checklists, maintenance logs, and pump datasheets

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: Fundamentals of Pump Operation

- Module 1: Introduction to Pump Systems and Classifications (07:30 – 09:30) • Overview of pump functions and industrial applications • Classification: dynamic vs positive displacement pumps
- Module 2: Centrifugal Pumps – Design and Characteristics (09:45 – 11:15) • Impellers, casings, seals, and flow principles • NPSH, head, flow rate, and BEP
- Module 3: Positive Displacement Pumps (11:30 – 01:00) • Piston, gear, diaphragm, screw, and vane pumps • Operating conditions and control methods
- Module 4: Workshop – Pump Type Selection (02:00 – 03:30) • Match pump types to various process requirements

Day 2: Performance, Curves, and Energy Efficiency

- Module 1: Reading and Interpreting Pump Curves (07:30 – 09:30) • Head vs flow, efficiency, power curves • System curves and operating point
- Module 2: Affinity Laws and System Matching (09:45 – 11:15) • Impact of speed and impeller diameter on performance • Pump sizing and throttling
- Module 3: Energy Efficiency and Pump Optimization (11:30 – 01:00) • Common sources of energy loss • Variable speed drives (VSDs) and energy savings
- Module 4: Workshop – Curve Analysis Exercise (02:00 – 03:30) • Select optimal pumps based on performance data

Day 3: Maintenance Strategies and Inspection

- Module 1: Preventive Maintenance Planning (07:30 – 09:30) • Inspection routines, oiling schedules, and wear checks • Maintenance intervals and recordkeeping
- Module 2: Predictive Techniques – Vibration & Thermography (09:45 – 11:15) • Common vibration signatures and fault indicators • Using IR cameras for early problem detection
- Module 3: Mechanical Seals and Packing (11:30 – 01:00) • Seal types, installation techniques, and troubleshooting • Packing gland maintenance
- Module 4: Workshop – Maintenance Checklist Design (02:00 – 03:30) • Develop PM checklists for centrifugal and PD pumps

Day 4: Troubleshooting and Failure Prevention

- Module 1: Common Pump Failures and Root Causes (07:30 – 09:30) • Cavitation, bearing failure, seal leaks, and misalignment
- Module 2: Troubleshooting Techniques (09:45 – 11:15) • Fault isolation using flow, pressure, and vibration data
- Module 3: Alignment and Balancing (11:30 – 01:00) • Laser alignment basics and balancing principles • Alignment tolerances and thermal growth considerations
- Module 4: Workshop – Fault Diagnosis Simulation (02:00 – 03:30) • Evaluate case studies and recommend corrective actions

Day 5: Installation, Commissioning & Reliability Improvement

- Module 1: Installation and Start-Up Best Practices (07:30 – 09:30) • Foundation design, piping layout, and anchoring • Commissioning checklists and acceptance testing
- Module 2: Lubrication and Cooling Systems (09:45 – 11:15) • Oil types, levels, contamination monitoring • Cooling arrangements and flush plans
- Module 3: Reliability Improvement Strategies (11:30 – 01:00) • Reliability-centered maintenance (RCM) principles • Using failure history to improve PM and redesigns
- Module 4: Certification and Wrap-Up (02:00 – 03:30) • Final review and participant feedback • Certificate distribution and course closure

Certification

Participants will receive a Certificate of Completion in Pump Types & Maintenance, validating their expertise in the operation, inspection, and reliability management of industrial pump systems across various applications.

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