PUMPS AND VALVES: OPERATION, MAINTENANCE AND TROUBLESHOOTING

COURSE OVERVIEW

This comprehensive 5-day course is designed to equip participants with the essential knowledge and practical skills required for the efficient and safe operation, maintenance, and troubleshooting of various types of pumps and valves in industrial systems. From foundational hydraulic principles and equipment selection to advanced maintenance practices, performance monitoring, and root cause analysis, the course covers the full spectrum of managing these critical components. Through a blend of theoretical understanding, practical insights, and real-world case studies, attendees will learn to diagnose common issues, implement effective solutions, and ensure the reliability and safety of their pumping and valving systems.

DATES, VENUES AND FEES

09 – 13 November 2025 – Doha

(5 Days)

Fees US$ 4500

Note: Fee is per participant.
Groups from the same company can enjoy a **discounted** price.

WHO SHOULD ATTEND?

This course is appropriate for a wide range of professionals but not limited to:

- Plant Operators
- Maintenance Technicians
- Mechanical Engineers
- Process Engineers
- Reliability Engineers
- Supervisors
- Technicians
- Junior Engineers

CONTACT US NOW

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Millennium Solutions Training Center FZ-LLC
First Floor, Office #134, Knowledge Park, Block 2B, Dubai, UAE
Email: info@mstcme.com
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ACCREDITATION

This training course is certified by CPD.

The CPD Certification Service is the leading independent CPD accreditation institution operating across industry sectors to complement the Continuing Professional Development policies of professional institutes and academic bodies. The CPD Certification Service provides support, advice, and recognised independent CPD accreditation compatible with global CPD principles. CPD is the term used to describe the learning activities professionals engage in to develop and enhance their abilities and keep skills and knowledge up to date. CPD Units are only awarded to programmes after each programme is scrutinised to ensure integrity and quality according to CPD standards and benchmarks.

COURSE CERTIFICATE

MSTC certificate will be issued to all attendees completing a minimum of 80% of the total tuition hours of the course.

CPD internationally recognized certificate will be issued for all participants who will meet the course requirements.
CPD certificates will be issued within a month of the successful completion of the course.

TRAINING METHODOLOGY

- Expert instructor lecture, input using numerous visual aids
- Supportive comprehensive course manual enabling practical application and reinforcement
- Participant discussion and involvement regarding their specific projects and challenges
- Real-world case studies and best practices

LEARNING OBJECTIVES

To equip participants with knowledge and practical skills to operate, maintain, and troubleshoot pumps and valves efficiently and safely.

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COURSE OUTLINE

DAY 1

Fundamentals of Pumps and Valves

- Pre-test
- Introduction to Pumps and Valves in Industrial Systems
- Overview of Pump Types: Centrifugal, Positive Displacement, Gear, Diaphragm, Screw, etc.
- Overview of Valve Types: Gate, Globe, Ball, Butterfly, Check, Control Valves
- Basic Hydraulic Principles (Flow, Pressure, Head, NPSH)
- Pumps and Valves Selection Criteria
- Pumps and Valves Material Compatibility and Application Considerations
- Quiz

DAY 2

Operation Principles and Performance Monitoring

- Operating Characteristics of Pumps (Performance Curves, Efficiency, System Head)
- Valves Operating Principles and Flow Characteristics
- Cavitation and its Effects on Pumps
- Pumps Proper Startup and Shutdown Procedures
- Pumps Arrangements (Series/Parallel) and Flow Control Methods
- Understanding System Curves and Matching Pump Curves
- Quiz

DAY 3

Maintenance Practices and Schedules

- Preventive vs Predictive Maintenance
- Lubrication Techniques and Intervals
- Mechanical Seals, Packing, Bearings: Inspection and Replacement
- Valve Stem Packing and Gland Maintenance
- Maintenance Planning and Recordkeeping
- Spare Parts Management and Inventory Best Practices
- Case study

DAY 4

Troubleshooting Techniques

- Diagnosing Common Pump Problems (No Flow, Low Flow, Overheating, Vibration, Noise)
- Valve Troubleshooting (Leakage, Sticking, Actuator Issues)
- Root Cause Analysis Techniques
- Vibration and Temperature Monitoring
- Use of Diagnostic Tools (Flow Meters, Pressure Gauges, Thermal Imaging, Vibration Analyzers)
- Emergency Response to Pump or Valve Failures
- Case study

DAY 5

System Integration, Safety, and Case Studies

- Integration of Pumps and Valves into Piping Systems
- Automation and Control Systems (SCADA, PLC for valves/pumps)
- Safety Considerations: Lockout/Tagout (LOTO), Pressure Hazards
- Environmental and Operational Risks
- Real-World Case Studies of Failures and Solutions
- Post Test
- Certification ceremony

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