

€ TRAINING

Pump Technology



Pump Technology

Introduction:

This course will introduce delegates to the different types of pumps and valves and their associated terminology. Centrifugal and positive-displacement pumps, packing, mechanical seals and sealing systems, bearings, and couplings will all be discussed. Valves for isolation and valves for control will be addressed.

The application of the different types of pumps and valves will be discussed along with their suitability for different operational duties. The operation, troubleshooting, and maintenance will be dealt with in-depth

Course Objectives:

At the end of this course the participants will be able to:

- Understand the different types of pumps and their associated terminology
- Understand the Centrifugal and positive displacement pumps, packing, mechanical seals and sealing systems, bearings, and couplings
- Understand the different parameters affecting the operation of valves
- Select the right valve for the particular application and to perform the necessary calculation for valve sizing
- Perform troubleshooting of systems involving valves
- Decide on the right maintenance plan concerning different types of valves

Targeted Audience:

- Supervisors
- Team Leaders
- Technicians
- Anyone who wishes to update themselves on pump and valve technology, judge the suitability of different types of pumps and valves for their needs, and learn how to operate and maintain them for the benefit of their organizations

Course Outlines:

Unit 1: Pumping Systems:

- Introduction
- Pump Types and Terminology
- Pump Performance Centrifugal and Positive Displacement
- Understanding Head
- Types of Head: Friction, Pressure, Static & Velocity
- Friction in Valves, Piping & Fittings
- Calculating Actual Head in a System
- Cavitation in Pumps and Valves
- Net Positive Suction Head NPSH
- Vapour and Gas Cavitation
- Flashing VS Cavitation

Unit 2: Pump Types:

- Positive Displacement Pumps
- Reciprocating Pumps
- Reciprocating Pump Valves
- Rotary Pumps - scroll and gear types
- Failure Mechanisms - identification and monitoring

Unit 3: Centrifugal Pumps:

- Centrifugal Pump Theory
- Pump Components
- Matching Pumps with Drivers
- Performance Analysis
- Failure Mechanisms
- Identification and monitoring

Unit 4: Achieving Pump-Reliability:

- Sealing Systems
- Conventional Packing Glands, Mechanical Seals & Flush Plans
- Seal Failure Mechanisms
- Maintenance and Repair of Mechanical Seals
- Bearings - failure modes and how to extend life lubrication
- Plain Bearings
- Anti-Friction Bearings
- Couplings & Alignment
- Couplings
- Alignment & Balancing
- Foundations & Bedplates

Unit 5: Valves Technology:

- Types of Valves globe, gate, ball, plug, check
- Flow Characteristics
- Flow-through Valves
- Valve Flow Characteristics
- Linear, Quick Opening & Equal

Unit 6: Valve Sizing:

- Calculating the Correct Cv Value
- Selecting Valve Size Using Valve Coefficient
- Calculations for Correct Valve Selection

Unit 7: Sealing Performance:

- Leakage Classifications
- Sealing Mechanisms
- Valve Stem Seals

Unit 8: Valves Troubleshooting & Maintenance:

- High-Pressure Drop
- Pressure Recovery Characteristics
- Flow Choking
- High Velocities
- Water Hammer
- What causes a water hammer?
- Solutions for Water Hammer
- Troubleshooting the Control & Isolation Valves
- Review of Common Faults
- Developing a Preventive Maintenance Plan