

Practical Pump & Valve Technology

INTRODUCTION

- This Practical Pump & Valve Technology training seminar 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. Operation, troubleshooting and maintenance will be dealt with in depth.

The knowledge gained in this training seminar will:

- Enable the delegate to optimise the operation and maintenance of different types of pumps
- Give the delegate confidence to carry out failure analyses on pumps thereby avoiding repetitive failures
- Allow tighter control of maintenance budgets by the avoidance of unplanned equipment failures in service

OBJECTIVES

At the end of this training seminar, participants will:

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

TRAINING METHODOLOGY

- This Practical Pump & Valve Technology training seminar will be conducted along workshop principles with formal lectures, case studies and interactive worked examples. Relevant case studies will be provided to illustrate the application of each tool in an operations environment. Each learning point will be re-enforced with practical exercises. There will be ample opportunities for discussion and sharing experiences.

ORGANISATIONAL IMPACT

- On completion of this Practical Pump & Valve Technology training seminar, the delegate will be able to critically analyse the methodologies employed within the organisation and instigate improvements where required.

PERSONAL IMPACT

- Technical knowledge is key to effective control and peer respect within any maintenance organisation, when this is achieved personal satisfaction follows. This Practical Pump & Valve Technology training seminar will give the delegate the required level of technical knowledge and skill to achieve that personal satisfaction.

WHO SHOULD ATTEND?

This training seminar is directed towards:

- Supervisors
- Team Leaders
- Technicians
- This Practical Pump & Valve Technology training seminar will also benefit 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 organisations.

Course Outline

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

Pump Types

- Positive Displacement Pumps
- Reciprocating Pumps
- Reciprocating Pump Valves
- Rotary Pumps – scroll and gear types
- Failure Mechanisms – identification and monitoring
- Centrifugal Pumps
- Centrifugal Pump Theory
- Pump Components
- Matching Pumps with Drivers
- Performance Analysis
- Failure Mechanisms – identification and monitoring

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

Valves Technology

- Types of Valves (globe, gate, ball, plug, check)
- Flow Characteristics
- Flow through Valves
- Valve Flow Characteristics
- Linear, Quick Opening & Equal %
- Valve Sizing
- Calculating the Correct Cv Value
- Selecting Valve Size Using Valve Coefficient
- Calculations for Correct Valve Selection
- Sealing Performance
- Leakage Classifications
- Sealing Mechanisms
- Valve Stem Seals

Valves Troubleshooting & Maintenance

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