



# Valve Selection, Maintenance & Repair Masterclass



## Introduction:

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The overall purpose of this course is to provide engineers and senior technicians in their relevant fields with the applied knowledge that enables them to efficiently select, maintain or repair different types of valves, including control valves and their accessories. The course provides a comprehensive overview about the basis behind the selection of different types of valves used in oil & gas industry. In addition it covers valves selection, installation, testing & carry out preventive, predictive and corrective maintenance on valves. Emphasis is placed on selection, sizing and maintenance of different valve types.

## Who Should Attend?

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Maintenance & Technical Support Engineers & Supervisors, Maintenance & Technical Support Engineers & Supervisors, Senior Foremen Mechanical Maintenance, Engineering, inspection and technical staff in piping designs, process, operations and maintenance, Engineers and working operators in field of pipelines, The course provides a wider knowledge to piping designers, engineers, technicians, foremen inspectors & repair-men.

## Course Objectives:

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**By the end of this course delegates will be able to:**

- The ability to carry out the selection and sizing process
- Understanding the problems and phenomenon associated with valves operation
- The ability to select the right valve for the particular application
- The ability to perform the necessary calculation for valve sizing
- The ability to carry out troubleshooting of valves and systems that valves are connected to
- The ability to perform troubleshooting of systems involving valves
- The ability to decide on the right maintenance plan concerning different types of valves
- Safety and relief valves play a vital role for the safety concerning equipment and personnel

## Course Outline:

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### Classification of Valve Types

- Valve functions and characteristics
- Basic valve parts
- Valve body attachments

### Valve Selection for Petroleum & Process Industry

- Principles of valve operations
- Specifications
- Body materials and dimensions
- Pressure and temperature
- Wear, galling, and leakages
- Flow characteristics & noise
- Sizing, including actuators
- Which valve for on-off service?

- Which control valve to specify?

### Specification & Applied Codes

- API
- ASM

### Critical Valve Choices

- Internal working
- End connection
- Bonnets
- Actuator
- Acceptance procedure for in-house valve testing and verification
- Noise abatement for valves

### Installation Maintenance Guidelines

- Cleaning and inspection guidelines
- Cautions for every type
- Fouling leakage
- Wear leakage
- Maintenance of special valve types
- Lining up valves for a system start up
- Using plant procedures and drawings
- Lubricating valves
- Valve inspection and cautions
- Repair and replacement of valve parts
- Corrosion control in valves - diagnostic tools
- Safety aspects

### Preventive Maintenance

- General philosophy

- Upside
- Downside
- CLAIR activities

### **Predictive Maintenance**

- Monitoring techniques
- Twelve essential steps in building a PDM program

### **Valves Problems and Troubleshooting**

- High pressure drop
- Pressure recovery characteristics
- Cavitations in valves
- Incipient and choked cavitations
- Flow curve cavitations index
- Cavitations - elimination devices
- Flashing versus cavitations
- Flow choking
- High velocities
- Water hammer
- Surge protection
- Check valve slamming
- Noise problems
- Clean air standards
- Life loading

### **Packing for fugitive-emission control**

- Troubleshooting the control valves