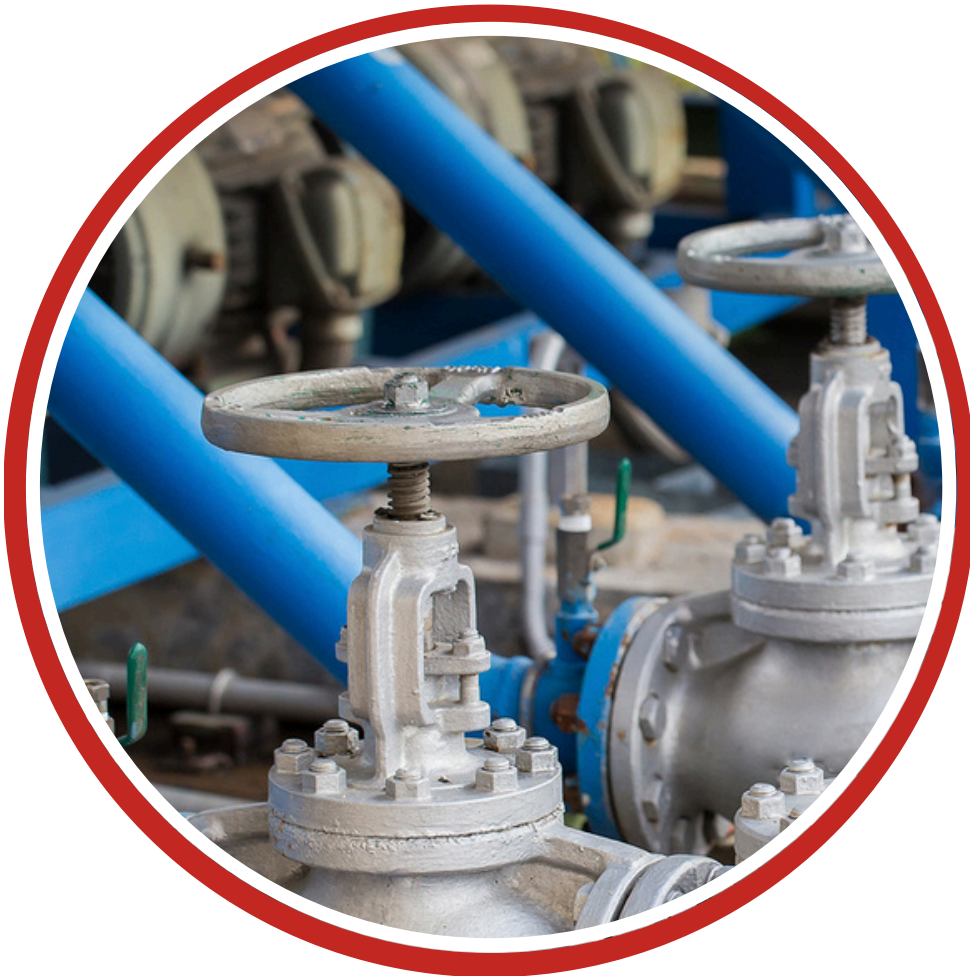


Process Control Valves



Energy Milestones Corporation Advancing Professionals to the next level

Energy Milestones is proud to be accredited, partner and associated with the following association bodies:



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Process Control Valves



Overview

Power plants and other petrochemical industries utilise various types of valves. All piping systems are equipped with valves for controlling purposes or to meet safety requirements. Understanding the function of each valve type will have a significant impact on process quality, equipment and plant reliability, and the economics of the entire activity. Different applications require selecting the appropriate valve type based on their particular flow characteristics. Operation of the valve also affects the system and the process. Understanding the problems associated with valves is essential for accurate diagnosis, troubleshooting, and proper maintenance of the particular type of valves.

Course Objectives

- An understanding of valve characteristics and different parameters affecting the operation of valves
- Knowledge of the main types of valves and the ability to select the right valve for the particular application, including Control Valves, Non-Return Valves and Safety Valves
- The ability to perform the necessary calculations for valve sizing
- Knowledge of valve control systems, including actuators and positioners
- An understanding of the problems associated with valves, like flashing, slamming and water hammer
- The ability to perform troubleshooting of systems involving valves and make decisions on the proper maintenance plan concerning different types of valves



Process Control Valves

Course Content

1. Basics of the Valve Technology

- Types of Valves and Selection
- Valve Parts and Components
- Valve Flow Characteristics – Linear Valve Features
- Control Valve Flow Characteristics – Quick Opening, Linear, Equal Percentage
- Valve-sizing criteria – Valve Coefficient, Cv
- Pressure Recovery

2. Valve Functions and Types

- Functions of valves and Methods of regulation
- Valve Types – Stopping/starting valves, Control valves
- Valve end connections
- Valve components and trims
- Types of valves: Globe, Gate, Ball, Plug, Butterfly Valves, Pinch, Diaphragm Valves
- Pressure Regulation Valves

3. Check (Non-Return) Valves, Relief and Safety Valves

- Applications and Selection of Check (Non-Return) Valves
- Types of Check Valves – Swing, Lift, Tilting-disc, Piston
- Rupture Disk Valves
- Buckling (Shear) Pin Valves
- Relief and Safety Valves Types
- Relief Valves Problems

4. Control Valve Actuators and Positioners

- Actuation Systems and Forces
- Linear and Rotary Actuators
- Types of Actuators – Pneumatic / Hydraulic, Piston, Diaphragm, Electric motors
- Actuator Performance and Selection
- Valve Positioners and Operation
- Examples of valve installation plans and checklists



Process Control Valves

Course Content

5. Valve Troubleshooting

- High Pressure Drop – Pressure Recovery Characteristics
- Cavitation and Flashing in Valves – Cavitation-elimination devices
- High Velocities – Erosion
- Water Hammer – Causes and Solutions
- Surge Protection
- Noise Attenuation Problems
- Troubleshooting the Control Valves
- Valve Inspection & Testing (API598)

Targeted Audience

- Instrumentation, electrical, mechanical, process and maintenance engineers, specialists and staff
- Design teams
- Budgeting and financial staff
- Team leaders, supervisors and foremen

Course Methodology

Facilitated by an experienced professional trainer, this training course will be conducted as a highly interactive workshop session. A variety of training methodologies and facilitation techniques will be employed before and during the course, as applicable. These methods are aimed at enhancing individual and group interaction while maximising learning. Some of these methods are:

- Online Pre-post Test
- Colourful Visual Aids
- Gamification
- Self-Assessment Instruments
- Simulations
- Case Studies
- Videos
- Group Exercises & Discussions
- Role plays
- Indoor & Outdoor games

