

Course Name: Process Control Valves and Actuators

Reference Code: ELEC 103

About the course:

This training course will feature:

Essentials of control valves

Actuators and associated valve equipment

Theoretical and practical sizing aspects

Selection, installation and maintenance essentials

Tuning and optimizing a process using control valves

Course Objective:

By the end of this training course, participants should be able to:

- Comprehend valve operation
- Understand and appreciate assorted common valve types
- Size and select the correct valve set (including actuators), suited to each specific application
- Choose suitable positioners, based on prevailing conditions
- Use multiple techniques to tune a valve-controlled process

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Who Should attend?.

This training course is suitable to a wide range of professionals but will greatly benefit:

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

Course Methodology:

This training course is designed to be a hands-on, stimulating experience. The training course is highly interactive with many discussion and practice sessions.

- ☑ Relevant computer simulations and videos .
- ☑ Copies of all presentation material.
- ☑ Variety of Learning Methods.
- ☑ Pre-test and final test.
- ☑ Case Study
- ☑ Training Groups.
- ☑ Presentation.
- ☑ Lectures

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Course Outline:

Day One: Introduction and Theory

- Control valve purpose and principles
- Flow conditions and pressure drops inside a valve
- Control valve and actuator signals
- Types of flow, Reynold numbers, vortices, gas vs liquid flow, Cv, Choked flow, etc.
- Cavitation and flashing
- Valve classification, associated hardware and an introduction to valve types

Day Two: Valve Specifics, Characteristics and Sizing

- Continuation of valve types
- Valve selection and valves in P&IDs
- Valve leakage
- Valve characteristics (including equal percentage, linear, etc.)
- The relationship between inherent versus installed characteristics
- Calculations pertaining to valve sizing for a liquid application

Day Three: Actuators, Positioners, Trims, Maintenance and Safety

- Valve sizing, using software
- Actuators, and the choices available
- Valve positioners
- Cavitation and noise control
- Valve installation and maintenance
- Pressure relief and SIS valves

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Day Four: Process Control Using Control Valves

- Introduction to process control
- The PID controller
- Open-loop tuning
- Closed-loop tuning
- Trial & error tuning (open and closed loop)

Day Five: Optimum Control, Using Control Valves

- Valves in cascade loops
- Valves in ratio loops
- Valves in non-linear loops
- Valves in loops with long time delays
- Valves used in conjunction with PLCs
- New innovations in control valve technology

Time: 08:00 AM -03:00 PM **Numbers of hours:** 35 Hours

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