



ICE001

Process Control, Measurement & Control Valves

Course Introduction:

This course addresses both general and specific knowledge of the field of Instrumentation and Industrial Process Control, which is invaluable to Plant Planners, Plant operators and Engineers

The course explain why it is necessary to measure what is going on with your systems & equipment, how to measure it, and what those measurements, and to provide a quick and efficient overview of instrumentation, process measurement & control fundamentals. The course will explain may mean in terms of action that should be taken to eliminate future downtime or unnecessary expense.

Course Objectives:

Upon successful completion of this course, the delegates will be able to:

- ✓ Identify control valves used for various applications
- ✓ Understand piping and instrumentation drawings
- ✓ Management of equipment, calibration, traceability, measurement uncertainty, environment, test methods, test items, safety, quality control, records and reports etc.
- ✓ Understanding of estimating Uncertainty in Measurement
- ✓ Fundamentals and concepts of fiscal metering
- ✓ Operating procedures
- ✓ Field instruments
- ✓ Properties of fluids
- ✓ Different types of flow meters
- ✓ How to select, install, maintain and operate fiscal meters correctly
- ✓ Practical knowledge about fiscal metering in practice
- ✓ Design and configure simple flow-based control systems
- ✓ Tune Flow Control loops
- ✓ Confidently work with different flow instrumentation systems
- ✓ Specify flow meters
- ✓ Troubleshoot and install flow instrumentation
- ✓ Size and select different control valves
- ✓ Deal with cavitation and flashing
- ✓ Troubleshoot control valves

Who Should Attend?

This course is intended for all Automation engineers, Chemical engineers, Consulting engineers, Control engineers, Design engineers, Electrical engineers, Instrument fitters, Maintenance engineers, Mechanical engineers, Operations and production engineers, Process control technicians, Project engineers and managers.

Course Outline:

Day 1:

Pre Test

Introduction

- Overview of instrumentation and control
- Basic measurement concepts
- Definition of terminology
- Measuring instruments and control valves as part of the overall control system

Day 2:

Pressure Measurement

- Principle of pressure measurement
- Pressure transducers and elements

Level Measurement

- Principles of level measurement
- Simple sight glasses
- Hydrostatic pressure
- Ultrasonic measurement
- Differential pressure measurement

Day 3:

Temperature Measurement

- Principles of temperature measurement
- Thermocouples
- Resistance Temperature Detectors (RTD's)
- Thermistors

Flow Measurement

- Principles of flow measurement
- Differential pressure flow measurement
- Positive displacement
- Ultrasonic flow measurement
- Mass flow measurement
- Fiscal Measurement

Day 4:

Fundamentals of Control Loop

- Types of Control System
- Processes, controllers and tuning
- PID controllers
- Gain, dead time and time constants

Day 5:

Introduction to Control Valves

- Introduction
- Definition of a control valve
- Cavitation
- Flashing

Different Types of Control Valves

- Globe Valves
- Butterfly
- Eccentric disk
- Ball
- Rotary
- Plug

Post Test

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts

- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

Course Fees:

To be advised as per course location. This rate includes participant's manual, and-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session

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