



ICE059

Instrumentation & Control Fundamentals for Facilities Personnel

Course Introduction:

This 5 days course applies the fundamental instrumentation and control engineering principles to oil and gas facilities design and operation and is designed for Facilities personnel with or without a background in instrumentation or control engineering. The course is also designed to accelerate the development of new facilities Instrumentation and Control Engineers.

Through the use of individual and group problem solving, attendees will learn about field measurement devices, final elements and actuators, pressure relief and regulation, documentation, programmable logic controllers, power supplies, SCADA, DCS, SIS, hazardous areas, and installation methods. Participants will gain a better understanding of instrumentation and control components and systems and will gain a greater appreciation for instrumentation and control engineering.

Course Objectives:

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

- Final elements and actuators including control loops, control valves, shutdown valves, actuators, transducers
- Pressure relief and pressure regulation
- Supervisory Control and Data Acquisition (SCADA) Systems to include telemetry, RTUs, internet and web based
- Distributed Control Systems (DCS) including Fieldbus and Profibus
- Risk mitigation, technologies, and architecture of Safety Instrumented Systems (SIS)
- Field measurement devices including level, pressure, temperature and flow
- How to document instrumentation including tag numbers, P&IDs, loop and logic diagrams
- Process control basics with emphasis on control loops, types, strategies, and loop tuning
- How programmable logic controllers operate as well as their advantages, application, functionality, architecture, and programming
- The best practices for hazardous areas and equipment selection which will include area classification, NEC, IEC, equipment protection, selection, certification, location, and ingress

Who Should Attend?

This course is intended for all facilities and project engineers as well as newly graduated electrical, controls and instrument engineers who need to improve their basic understanding of instrumentation and control systems within oil and gas facilities.

Course Outline:

Day 1:

- Introduction
- P&ID Symbols and Exercise
- 4-20ma Control Loops
- Red Thread Exercise

Day 2:

- Field Measurement
- Accuracy, Field Measurement
- Level Devices
 - Field Measurement
- Temperature Devices
 - Field Measurement
- Pressure Devices
 - Field Measurement
- Flow Devices
 - Field Measurement

Day 3:

- Field Measurement Alarm and Shutdown Devices
- Instrument Index and Database
- Red Thread Exercise
- Controller Output Devices
 - Control Valves
 - Control Valves Sizing
- Pressure Regulation
- Pressure Relief

Day 4:

- Control System Basics
- Control Loop Tuning
- Programmable Electronic Systems (PLC, DCS, SCADA and SIS)
 - SCADA Overview
 - SIS Overview
 - PLC Overview
 - DCS Overview
- Red Thread Exercise

Day 5:

- Hazardous Area Classification
- Red Thread Exercises
- Recap

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 Certificate:

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

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