Industrial Process Measurement, Field Instrumentation and Control Systems Course

COURSE OBJECTIVES

This course provides knowledge and skill on how to use or apply an industrial process measurement and control in the plant. Technicians or engineers are provided with fundamentals to more effectively communicate with industrial measurement, transmitters, control valve and other control system.

This course teaches a systematic approach to calibration, installation and troubleshooting of industrial instrumentation equipments and how they are approach to stabilize a single and multi-loop control loops.

WHO SHOULD ATTEND?

This Intensive five-day instructional program covering the educational needs of Instrumentation and Control Engineers & Technicians, Plant Operators, Operation Engineers, Process and Utility Supervisors, and Technical Supervisory personnel involved in Industrial Process Measurement and Control. No specific prerequisite training or experience required for registration.

TRAINING OUTCOMES?

At the end of the course, the participants should be able to:

- Communicate the latest trends in measurement and control
- Understand the role of measurement and control in industrial processes
- Interpret measurement and control terminology
- Compare the methods and devices used in temperature, pressure, level, flow measurement
- Understand the operation and components of a feedback control loop
- Understand the fundamental concepts of controller tuning

- Understand why a systematic approach to troubleshooting is most effective
- Verify, locate, and identify performance problems and the causes of the problems
- Take or recommend appropriate follow-up procedures to minimize problem recurrence
- Identify the common causes of sensor, transmitter, controller, and final control element problems
- Troubleshoot control systems
- Understand the operation of pneumatic and electronic loops
- Check and utilize control loop documentation

COURSE PROGRAM

Process Control Concepts:

- Continuous,
- Batch,
- Discrete Control,
- The Role of Measurement and Control in Industry,
- Graphic Description of Loop Components,
- Component Loop Dynamics

Industrial Measurement Systems:

- Overview,
- Sensor Selection and Characteristics,
- Transmitters,
- Smart Transmitters

Pressure Measurements:

- Concepts,
- Instruments,
- Differential Pressure Measurement

Level Measurement:

- Concepts,
- Hydrostatic Head Level Measurement,
- Capacitance Level Measurement,

- Ultrasonic Level Measurement,
- By Weight

Flow Measurement:

- Fluid Fundamentals,
- Methods and Concepts,
- Differential Head Flow Measurement,
- Velocity Flow Measurement Devices,
- Mass Flowmeters .

Temperature Measurement:

- Concepts,
- Thermometers,
- Thermocouples,
- RTDs & Thermistors,
- Temperature Transmitters

Industrial Process Control:

- Basic Feedback Control,
- Components,
- PID Control,
- Final Control Elements,
- Tuning Concepts

Trends in Control Technologies:

- Smart Components,
- Fieldbus.

Approaches to Troubleshooting:

- Purpose of Troubleshooting,
- Reasons for Troubleshooting Equipment History,
- Input/Output (Serial) | Shotgun Approach,

- Logical Analysis

Logical Analysis Troubleshooting:

- Verify, Identify, Repair and Test.
- Follow-up on Problems

Single-Loop Feedback Control Troubleshooting:

- Measurement Concerns,
- Controller Operations,
- Signal Conditioners,
- Troubleshooting Simulation

Multi-Loop Control Systems Troubleshooting:

- Ratio (Two Controlled Streams, Wild Stream),
- Cascade,
- Three-Element Control,
- Troubleshooting Simulation

Introduction to control valve:

- Types of control valve
- Control valve characteristics
- Selection and application
- Control valve troubleshooting

About the Course Instructor

Engr. Azahar bin Mat Noor, graduated with Bachelor of Engineering (Honors) in Electrical Engineering and major in control system from the University of Technology Malaysia.

He is a Registered Professional Engineer (Mechanical) with Board of Engineer, Malaysia and a Member, The Institution of Engineers, Malaysia. He also holds an Instrumentation and Control System certificate from YEW Mitaka, Tokyo.

He had working experiences with several companies such as the Institute Technology Petroleum Petronas (INSTEP) and Centre for Instructor and Advanced Skill Training (CIAST).

Since the past 20 years in teaching, he had delivered for several courses such as;

- Process Design and Process and Instrumentation for process engineer.
- Process control technology for Instrument Engineer.
- Process control technology and application.
- Control valves service and repair.
- Instrumentation and measurement Engineering.
- Basic Instrumentation and Fundamental of Process Control.