Industrial Process Control

Course Information

Developers: Industrial Machining Mechanic State Curriculum Committee

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Credit Hours: 3

Description:

This course provides understanding of different types of process control systems like temperature, flow and level control. The course includes process control principles, thermocouples, RTD's, temperature measurement devices, ON/Off temperature controlled, programmable process heat controllers, transmitters, process loop test and operate system found in industrial application.

Competencies

1. Define the terms "Process" and "Process Variable" as they apply to an Industrial Control System.
2. Identify the four main elements (Primary Element, Measuring Element, Controlling Element and Final Control Element) of an Automatic Control System and explain what each element does.
3. Describe the difference between Closed Loop and Open Loop control systems.
4. Explain what a Process Disturbance is and how a Process Disturbance can affect a Process Control System.
5. Explain how the electrical terms Resistance and Capacitance can also apply to Fluid Processes, Thermal Processes and Pneumatic Processes.
6. Explain how Feedback Control and Feedforward Control are accomplished by a Manual Control System and by an Automatic Control System in a process with a supply and a demand.
7. Explain the ways in which a Controller can be identified (by its power source, by the process variable it controls and by the kind of controlling action it provides).
8. Describe the four basic functions of Controllers (Measuring, Comparing, Computing and Correcting).
9. Compare the terms Proportional, Integral and Derivative with the terms Gain, Reset and Rate and determine how these Modes of Operation affect Controller Response.
10. Describe what constitutes a Single Element Control Loop and a Multiple Element Control Loop.
11. Explain why the following Control Loops are considered Multi-Element Control Loops: Ratio, Cascade and Auctioneering.

12. Demonstrate the ability to monitor and troubleshoot a Resistance Temperature Device (RTD) and a Thermocouple using a Multimeter.