



Electrical Troubleshooting & Preventive Maintenance

This development course is available in both virtual and in-person, instructor-led formats, it is a two-day “hands-on” electrical troubleshooting & preventive maintenance course that allows team members to work with real world components while learning how to fix electrical problems quickly and safely.

Description:

This two-day seminar was created to bring team members up to speed in their electrical troubleshooting skills as efficiently as possible, and it was designed to cover the most performed electrical troubleshooting tasks a maintenance technician faces in their job every day. For the novice or experienced electrician, this development course provides a no-nonsense, practical, and real-world systematic approach to electrical troubleshooting. This course can also be adopted as part of a company’s regular Qualified Electrical Worker program.

Course Outline:

Day One – Topics

Basic Skills for Electrical Troubleshooting

1. Safety First
2. OSHA Requirements Regarding Troubleshooting and Qualified Persons
3. Using Electrical Drawings for Troubleshooting
4. Using Electrical Meters to Perform Circuit Measurements
5. Developing a Logical, Systematic Approach to Troubleshooting

Troubleshooting Control Circuits - Hands-on Exercises

1. Building a Circuit from a Ladder Diagram
2. Control Circuit Industrial Applications
 - a. Control Relay Logic Circuits
 - b. Automatic Motor Control Circuits
 - c. Timer Sequence Circuits



3. Testing Field Components:
 - a. Control Relays
 - b. Motor Starter Contactors
 - c. Overload Devices
 - d. Solid State Timers
 - e. Limit Switches
 - f. Auxiliary Contact Blocks
 - g. Indicator Lamps
 - h. Push Buttons and Selector Switches
 - i. Circuit Breakers and Fuses
4. Troubleshooting Motors
 - a. Most Common Motor Problems
 - b. Electrical and Mechanical Concerns
 - c. Performing Electrical Tests on a Motor – Hands-On Exercise
 - d. Using the Megohmmeter on a Motor – Hands-on Exercise
 - e. Testing Windings for Shorts, Opens and Ground Faults
 - f. Phase Unbalance
 - g. Phase Rotation Testing
 - h. Forward/Reverse Motor Starters

Day Two – Topics

Troubleshooting Power Distribution

1. Wye and Delta Systems
2. Overcurrent Protection
3. Checking and Replacing Fuses
4. Branch Circuits

Power Quality Problems

1. Sources of Power Quality Problems
2. Test Equipment for Troubleshooting Power Quality Problems
3. Harmonics
4. Phase Unbalance



Troubleshooting Lighting Circuits

1. Lighting Terminology
2. Types of Lighting Circuits
3. Incandescent Lighting
4. Fluorescent Lighting
5. HID Lighting
6. LED Lighting

Troubleshooting Programmable Logic Controllers (PLCs)

1. Overview of PLCs
2. Components
3. Reading PLC Ladder Diagrams
4. Status Indicators and Error Codes
5. Force and Disable
6. Startup Procedures

Troubleshooting Variable Frequency Drives (VFDs)

1. VFD Terminology
2. VFD Basic Operation
3. Components
4. Common Problems and Corrective Action

Electrical Preventative Maintenance

1. Why Perform Electrical Maintenance
2. Overview of an Electrical Maintenance Program
3. Building Your Own Walk-Through Inspection Checklist