

## Industrial Controls Simulator Lab

Automated motor control systems play a big role in the production and efficiency of industrial operation. Their correct installation, operation and maintenance can save thousands of dollars. The purpose of this course is to provide a comprehensive overview of motor control systems including in-depth troubleshooting techniques utilizing controller simulator software. Participants will work either individually or in small teams to operate a user friendly industrial controls simulator software program that is loaded on laptops. Lectures, visual aids, and student hands-on performance will also be utilized to provide the greatest possible exposure to motor control circuitry. Anyone who works on or near power generation, transmission, or distribution systems should attend this course. Additionally, supervisors, managers, safety personnel, and those responsible for ensuring a safe work environment should attend this course.

Duration: 16 Hour Program

### **THEORY OF AUTOMATED MOTOR CONTROL**

Manual Control of Motors  
Automated Return to Power  
Automated System Control  
Input-Process-Output Model

### **SYSTEM COMPONENTS**

Main Line Contactor  
Motor Circuit Protectors  
Overload Protection  
Control Power Transformer  
Control and Line Fuses  
Control Relays/Timing Relays  
Manual Switches/Temperature Switches  
Pressure Switches/Level Switches  
Motors  
Heaters  
System Monitoring

### **DIAGRAM ANALYSIS**

Standard Symbols  
Power Diagrams  
Control Diagrams

### **SAFETY**

PPE  
Boundaries  
Inspection and Use of Test Equipment  
Lockout-Tagout

### **TROUBLESHOOTING LAB**

Observing Normal Operation  
Taking Baseline Data  
Methodological Approaches  
Selecting Measurements and Recording  
Using Front Panel Indications and Controls  
Sequencing Faults  
Motor Failures/Sensor Failures  
Interconnecting Wiring Faults  
Power System Failures/Control Power Failures  
Control Relay Faults/Timing Relay Faults  
Individual Component Testing

### **COMPONENT REPLACEMENT**

Nameplate Data and Ratings  
Technical Data  
Component Replacement Criteria  
Verifying Operation Post-Replacement