

# Motor Control Operations and Troubleshooting

Two-Day Course Outline



## Ensuring Power System Safety

Maintaining your motor control systems is an essential part of keeping your facility operational, productive, and safe. Unplanned downtime can eat away at your profits, but a solid understanding of motor control operations and troubleshooting are critical components to operating safely and reliably.

Remaining informed on the proper techniques to detect, inspect, and then safely troubleshoot issues is crucial to achieving operations targets and eliminating safety hazards. To be effective, operators are required to have in-depth understanding of recognized hazards that are likely to cause serious physical harm to employees.

Participants who complete this course will learn about operational considerations and troubleshooting, critical requirements, safety protocols, and the practical application of their learnings.

### Experts in Reliability

To learn more about HVM's Training Services, please contact us at 1-866-HVM-TEAM or visit [HVMcorp.com](http://HVMcorp.com).

## Course Overview

This class presents a logical approach to troubleshooting electrical control systems. It provides an understanding of common motor control circuits and motor diagnostic techniques. In addition, participants who complete this course will practice diagram analysis for troubleshooting. Where possible, the types of controllers utilized in the facility will be integrated into the presentation to maximize the learning experience.

The agenda will also include a review of components, and best practices for predicting the likelihood of equipment failure and identifying problems.

**Course Duration: 16 Hours.**

## Two Day Seminar Course Outline

### Day 1

#### Safety

- Qualified Persons
- Manufacturers' Literature Information
- Operations and Maintenance Guidelines

#### Diagram Analysis

- Layout Diagram
- Devices / Symbols
- Sensing
- Diagram Types

#### Types of Motor Controllers

- Full Voltage
- Across the Line Voltage
- Synchronous Starters
- Medium Voltage Starters
- Programmable Alarms and Set Points

#### Components

- Circuit Breakers
- Fuses
- Electronic Protection
- Relays
- Time Delays
- Contactors
- Potential Transformers
- Current Transformers

## Training Materials

HVM will provide any necessary supplemental materials. A "Certificate of Completion" is provided for students meeting or exceeding minimum course standards. Minimum course standards are defined as an 80% score on the written post-course examination. Upon successful completion of the assessment, you will receive 1.6 CEU credits. Our CEUs are IACET-Certified.

### Day 2

#### Contactors Construction

- Air-Break
- Vacuum

#### Motor Construction

- Name Plate Information
- Protection Considerations

#### Operational Considerations

- Control Power
- Interlocks
- Protective Devices
- Auxiliary Relays
- Remote Controls
- Breaker Auxiliary Contacts
- PLC Fundamentals

#### Basic Support Requirements

- System Familiarity
- Documentation
- Test Equipment

#### A Focused Approach to Troubleshooting

- Interlocks
- Control

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