Content Community Connection

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Electrical Troubleshooting Training

View Course Details

COURSE DATES AND TIMES

April 13-14 , 2026

10:00 am - 4:30 pm ET

November 9-10 , 2026

10:00 am - 4:30 pm ET

Electrical Troubleshooting Training - Our 12-hour live online course teaches how important it is to establishing a preventative maintenance program. The most important thing is to maintain the uptime of electrical equipment and significantly reduce both planned and unplanned downtime. Unplanned downtime costs are difficult to calculate, but often significant. For some industries, it can represent 1 to 3 per cent of revenue (potentially 30 per cent to - 40 per cent of profits) annually.

Our course equips professionals with essential information they need to identify, analyze, and resolve electrical troubleshooting issues in industrial, commercial, and institutional settings. Students will learn to diagnose problems using proven techniques and tools, improving system reliability and reducing downtime. The course emphasizes safe practices, troubleshooting methods.

This dynamic and interactive electrical testing and troubleshooting course will review equipment necessary to perform a Site Survey, such as industry oscilloscopes and Multimeters, Power Quality Analyzers, Current Clamp meters, and Mini Infrared Thermometers.

- Learn how to perform insulation tests, insulation voltages, plus a wide range of DMM tasks with confidence and ease. Necessary for work on generators, transformers, motors, cables and switchgear.
- Learn how to accurately measure AC current without breaking the circuit
- Check for hot spots and measure temperature with the Mini non-contact thermometers.
- Measure voltage level, current balance, harmonics, power, energy, power factor, displacement power factor, determine bad or marginal circuit breakers and other

electric power components.

Preventive Electrical Maintenance

Insurance claims data demonstrate that roughly half of the cost associated with electrical failures could be prevented by regular maintenance. To determine the cost of a failure, it helps to consider three key categories: Loss of income due to downtime, cost of labor to troubleshoot, repair and restart and cost of damage equipment.

Inexperience and poor planning will inevitably result in prolonged delays in electrical equipment start up which can lead to costly productivity losses. This course provides invaluable information to anyone who wishes to know and understand the role of Electrical testing and troubleshooting of electric power systems. The importance of planning and preparation for electrical testing projects, from engineering to testing, troubleshooting and commissioning and eventual start up, will be emphasized. This course deals with safety considerations and testing and troubleshooting for all the components of any electrical system.

Our Electrical Troubleshooting Training course will include practical information on how to troubleshoot:

- Generator failures
- Motor failures
- Transformer failures
- Circuit breaker/relay/fuse failures
- UPS & Battery System failures
- Cable failures
- PLC failures

WHO SHOULD ATTEND

This course is intended for:

- Industrial, commercial and institutional electrical maintenance personnel
- Electrical Apprentices
- Plant electricians
- Electrical testing technicians
- Testing engineers
- Electrical technologists
- Plant managers

and operating and maintenance personnel and all individuals involved in electrical equipment maintenance, testing and commissioning.

STUDENTS RECEIVE

- Certificate of Course Completion
- FREE 100-Page Digital Electrical Maintenance Handbook (Value $20)
- $100 Coupon Toward any Future Electricity Forum Event (Restrictions Apply)
- 1.2 Continuing Education Unit (CEU) Credits
- FREE Digital Magazine Subscription (Value $25.00)
- Course Materials in PDF Format

COURSE OUTLINE

Electrical Troubleshooting Training Course Outline

DAY ONE

1. Introduction to Electrical System Troubleshooting

- Skills and qualifications required to perform testing and troubleshooting
- Systematic Approach to Electrical System Troubleshooting
- Documentation Required to Perform Troubleshooting
- Electrical System Parameters Trending
- Safety requirements- CSA Z462

2. Electrical Safety Awareness

- Lockout/tagout procedures
- Safe work practices
- Personal protective equipment (PPE)

3. Problem Definition

- Symptoms
- Equipment list
- History

4. Electrical Testing and Troubleshooting Equipment

Before performing any troubleshooting, it's critical to understand the essential electrical testing equipment. This section covers the most common tools, including:

- Multimeters: For measuring voltage, current, and resistance.
- Clamp Meters: For non-invasive current measurements.
- Oscilloscopes: To visualize electrical waveforms.
- Insulation Testers (Megger): To check insulation resistance.
- Infrared Thermometers: For detecting hot spots indicating potential faults.

Each tool's functionality will be explained, along with proper usage techniques to ensure accurate troubleshooting and safe practices.

5. Mapping Control Circuits—ladder Diagrams

- Power rails and wire colors
- Arrangements—control element, load, circuit
- Line and wire numbers
- Tag names and common electrical symbol abbreviations

6. Logical Circuits

- AND – Series circuit
- OR – Parallel circuit
- Compound and complex circuits
- NOT circuit

7. Basic Electrical Principles

- Power Sources
- Transformers
- DC Sources
- UPS
- Flow of electricity
- Switches — Allow or prohibit current flow
- Loads

8. Transformers

- Magnetism
- Induction
- Primary/secondary
- Turn ratio
- Grounded and floating ground

9. Disconnecting Devices And Symbology

- Knife switch disconnects
- Fused
- Unfused
- Fuses
- Circuit breakers

10. Control Elements, Switches & Symbology

- Relay contacts—normally open, normally closed
- Ratings
- Solid-state,
- Timing,
- Overload relays
- Latching

DAY TWO

11. Supplementary Contact Symbols & Terms

- Breaks, poles, throws
- Single break, double break
- Single pole, double pole
- Single throw, double throw

12. Manual Switches—functionality And Symbology

- Selector switches
- Push buttons
- Drum and foot switches

13. Automatic Switches

- Limit switches
- Mechanical
- Optical
- Magnetic
- Electronic
- Acoustic
- RF
- Temperature, pressure, flow and float switches
- Motion switches
- Proximity and photo switches
- Speed switches

14. Troubleshooting Suggestions

- Measuring ohms, voltage and current
- Open faults and shorts
- Using the proper tools and meters
- Logical and sequential troubleshooting methods
- Meter categories and types
- Category
- Voltmeter impedance
- Safety and precautions

15. Ground-fault And Overload Protection

- Conductor sizing
- Ground-fault protection devices and sizing
- Motor starter sizing
- Motor overload protection sizing
- Disconnect sizing

16. Motor Overload Protection

- Thermal overloads
- Bimetallic overloads
- Magnetic overloads
- Solid-state overloads

17. Application Specific Circuits

- Common pumping circuits
- Common heating/cooling circuits
- Two-wire control and hands-off/auto
- Three-wire control—start/stop
- Jog/inch circuits
- Sequencing start and stop circuits
- Timing circuits
- Automatic sequencing circuits
- Forward/reversing circuits
- Plug stop and anti-plugging circuits
- Two-speed motor control
- Reduced voltage starting circuits
- Alarming and latching circuits
- Conveyor control circuits

18. Recordkeeping

- As found/as left drawings
- Equipment changes

COURSE TIMETABLE

Both days:

Start: 10:00 a.m. - Eastern Time
Finish: 4:30 p.m. - Eastern Time

Contact us Today for a FREE quotation to deliver this course at your company's location.

Request Quote