



General Electrical Safety Awareness

Course: E100

Length:	30 minutes
Text(s):	None
Prerequisites:	None
Certificate:	No
Exam:	No
Format:	Live or Web

Who should attend

- All "non-qualified" or "unqualified" employees
- Facility or Plant Management
- All production personnel
- Office staff and personnel
- Any general maintenance personnel who do not conduct electrical tasks

Class Summary

We are all exposed to electrical hazards. These electrical exposures occur primarily at home, but they can occasionally occur at work. This class will help to alert employees to these hazards in their every day surroundings. Furthermore, it will explain why they must not open electrical enclosures or interrupt maintenance personnel during energized work tasks. An overview of changes to the electrical safety program, the resulting impact on daily activities, and examples of typical electrical safety violations are covered.

Key Concepts

- Electrical Program changes to address energized work considerations
- Electrical hazard recognition & avoidance
- Observing Electrical Safety Boundaries
- Staying out of electrical enclosures

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Electrical Safety for Management and Supervision

Course: E120

Length:	2 Hours
Text(s):	None
Prerequisites:	None
Certificate:	Yes
Exam:	Available
Format:	Live or Web

Who should attend

Production, Shift & Maintenance Supervisors & Managers
Facility Managers
Department Heads
Anyone who manages, supervises or interacts with electrical workers but does not actively participate in electrical tasks or troubleshooting.

Class Summary

This class focuses on the major requirements of an electrical safety programs including personal protective equipment (PPE) and required boundaries for employee protection. By having an understanding of the most recent industry requirements, supervisors and managers can ensure that steps are taken to establish a safe environment for all employees during energized tasks. We will also discuss how the proper use of PPE can affect the completion time of electrical tasks and will review typical electrical safety violations so that they can be identified and corrected.

Key Concepts

Basic electrical hazards
Electrical program changes including PPE and the use of electrical boundaries
The impact of PPE usage on downtime & troubleshooting activities
Typical electrical safety violations

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Basic Electrical Skills for Electrical Workers

Course: E150

Length:	4 or 8 hours
Text(s):	None
Prerequisites:	E200 E180 & E210 Strongly Recommended
Certificate:	Yes
Exam:	Yes
Format:	Live only

Who should attend

All Qualified Persons including:

- Electricians
- General Maintenance
- Machine Technicians
- All maintenance staff who conduct energized tasks or open energized enclosures

Class Summary

It is often assumed that electrical maintenance personnel automatically understand how to perform basic electrical functions, but as maintenance personnel change job classification, their skills may not keep up with their responsibilities. In this class we investigate basic skills which all electrical maintenance persons should know, understand and be able to demonstrate proficiency.

Key Concepts

- Fuse testing
- Meter use
- Hands on demonstration for proficiency
- Electrical Power Basics
- Electrical Enclosures & operation
- Review of basic task procedures

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Individual Voltmeter Certification/Worker Audit Course: E170

Length: 2 hours Classroom/15 minutes per employee
Text(s): None
Prerequisites: E200
E150, E180 & E210 Strongly Recommended
Certificate: Yes
Exam: Yes (hands on)
Format: Live only

Who should attend

All Qualified Persons including:

- Electricians
- General Maintenance
- Machine Technicians
- Anyone who needs to use a voltmeter for troubleshooting or voltage verification purposes

Class Summary

In any lock out tag out procedure there is always a "TRY" step. For troubleshooting electrical systems, this "TRY" requires more than "pushing the green button." In order to establish an Electrically Safe Work Condition (ESWC) a voltmeter must be properly utilized to verify that all voltage is removed from the circuit. In this class we investigate various meter types, their functions and proper use for circuit testing and voltage verification. Although this course includes "classroom theory," a hands-on demonstration is required for all attendees to ensure an understanding of class room material.

Key Concepts

- Recognizing why a voltmeter is required for voltage verification
- Voltmeter concepts & choosing the right meter
- Safe Voltmeter use
- Hands-on demonstration

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Electrical Safe Work Practices

Course: E180

Length:	4 hours
Text(s):	Safe Work Practices for the Electrician (Jones & Jones)
Prerequisites:	None
Certificate:	Yes
Exam:	Yes
Format:	Live or Web

Who should attend

All Qualified Persons including:

- Electricians
- General Maintenance
- Machine Technicians
- All maintenance staff who conduct energized tasks or open energized enclosures

Also recommended:

- Facility Engineers & Engineering Managers
- Maintenance Supervisors & Managers
- Machine & General Technicians
- Key Management Personnel (to gain a better understanding of new electrical safety requirements)
- Contractors including: Electrical, HVAC, Machine, Chiller, Air Compressor, etc.

Class Summary

Before a new driver "hits the road" he must learn the basics of driving. Likewise, in the electrical trade, it is important to understand the basics, "Electrical Safe Work Practices." In this class we will learn the common safety practices that every maintenance person or his supervisor should know before being allowed to conduct electrical activities.

Selected Key Concepts

- Planning and Communication
- Exposure Management
- Recognizing Unsafe Installations
- Performing Repetitive Tasks
- Recognizing the Importance of Body Position
- Using Warnings against Hazards
- Maintaining Alertness
- Handling Conductive Material
- Using Portable Ladders
- Respecting Interlocks
- Closing Doors and Replacing Covers
- Closings Holes in Equipment
- Marking and Labeling



Hands-on Electrical Safety Review

**Course: E190A (for groups)
E190B (for individuals)**

Length: 1 Hour for group setting
Text(s): None
Prerequisites: E200
E180 Strongly Recommended
Arc Flash PPE is required for this class
Certificate: Available
Exam: Available
Format: Live or Web

Who should attend

All attendees of E100 or E200

Class Summary

In this class we move out of the classroom and onto the shop floor to demonstrate principles taught in E100 or E200. Depending on the size of the group and facility, one or more qualified persons will be required to demonstrate the principles taught in the classroom portion of the training. These will include the use of Personal Protective Equipment (PPE), establishing boundaries, opening energized enclosures and the completion of a typical task as assigned by the instructor. Group comments and questions will be used to help to further establish key concepts.

Note – if PPE is not available the scope of this class will be reduced in that no energized enclosures will be opened.

Key Concepts

- Understanding & interpreting the arc flash labels
- Proper selection and inspection of PPE
- Establish proper protective boundaries from label information
- Recognizing and identifying potential hazards associated with various electrical enclosures
- Safely opening and accessing an energized enclosure
- Completion of an assigned task by one of the participants

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Basic Electrical Safety for Qualified Workers

Course: E200

Length:	4 or 8 hours
Text(s):	NFPA 70E (recommended)
Prerequisites:	All attendees should have a basic understanding of electrical construction and practical troubleshooting skills E190A or E190B should be scheduled with E200 to meet OSHA requirements
Certificate:	Yes
Exam:	Available
Format:	Live or Web

Who should attend

All Qualified Persons including:

- Electricians
- General Maintenance
- Machine Technicians
- All maintenance staff who conduct energized tasks or open energized enclosures

Also recommended:

- Facility Engineers & Engineering Managers
- Maintenance Supervisors & Managers
- Machine & General Technicians
- Key Management Personnel (to gain a better understanding of new electrical safety requirements)
- Contractors including: Electrical, HVAC, Machine, Chiller, Air Compressor, etc.

Class Summary

This class is our cornerstone and most requested class on arc flash safety.

Key Concepts

- Shock and Arc Flash hazards
- Burns related to electrical work
- Complacency and electrical work
- Protective devices for electrical safety
- Hazard assessments
- Personal protective equipment (PPE) requirements for electrical safety
- Incident energies
- Establishing boundaries
- Overview of typical safety violations

Establishing an Electrically Safe Work Condition (Lock-Out Tagout)

Course: E210

Length:	2 Hours
Text(s):	NFPA 70E (recommended)
Prerequisites:	Understanding of Basic Electrical Concepts Familiarity with National Electrical Code (NFPA 70) E210 should be scheduled with E100 or E200 to meet OSHA Requirements
Certificate:	No
Exam:	No
Format:	Live only

Who should attend

Electricians & all maintenance staff who conduct energized tasks or open energized enclosures
Facility Engineers & Engineering Managers
Maintenance Supervisors & Managers
Machine & General Technicians
Key Management Personnel (to gain a better understanding of new electrical safety requirements)
Contractors including: Electrical, HVAC, Machine, Chiller, Air Compressor, etc.

Class Summary

The best way to protect your personnel from electrical hazards is to remove the hazard entirely. By doing so, no special precautions are required and the probability of an electrical accident is reduced to zero. In order to achieve this we must establish an ***Electrically Safe Work Condition*** (ESWC) as detailed in NFPA 70E Article 120. We will investigate the proper steps for creating an Electrical Safe Work Condition including proper procedures for zero voltage verification.

Key Concepts

Establishing an Electrically Safe Work Condition
Simple & Complex electrical Lock-Out steps
Use of voltage testing equipment
Methods for warning and communication hazards

Qualified Worker Electrical Safety Update Course: E230

Length: 2 Hour (4 hour upon request)
Text(s): None
Prerequisites: E200
Format: Live or Web

Who should attend

All Qualified Persons including:

- Electricians
- General Maintenance
- Machine Technicians
- All maintenance staff who conduct energized tasks or open energized enclosures

Also recommended:

- Facility Engineers & Engineering Managers
- Maintenance Supervisors & Managers
- Machine & General Technicians
- Key Management Personnel (to gain a better understanding of new electrical safety requirements)
- Contractors including: Electrical, HVAC, Machine, Chiller, Air Compressor, etc.

Class Summary

These topics are updated annually so that each annual or periodic update class provides not only a refresher but more depth in electrical safety topics covered in E200.

A portion of this class will be review of basic energized work safety requirements such as glove testing, PPE, and boundaries. The remainder of the session will be selected from one of the Advanced Topics shown below or may include changes in the NFPA 70E or other applicable standards which applies to electrical safety.

Advanced Topics

- Basic Electrical Definitions
- Electrical Permits
- Arc Flash PPE-Selection, Inspection, testing & Maintenance
- Advanced Topics in Hazards, Recognition and Prevention
- Contractors- Strategies for compliance
- Typical OSHA/Safety violations
- Arc Flash Theory-OCD's and hazard reduction
- Electrical Power Concepts
- Battery Systems
- Job Planning/Work Space Considerations
- Review of Written Program
- Written Procedure Review
- Recent Arc Flash Accidents and OSHA Enforcement



How to Maintain your Arc Flash Study

Course: E300

Length:	2 to 2.5 days
Text(s):	None
Prerequisites:	E200 & E210
Certificate:	Yes
Exam:	Optional
Format:	Live only

Who should attend

- Electricians
- Engineers
- Engineering Managers
- Maintenance Supervisors/Managers
- Safety Managers
- Anyone involved with implementing or maintaining an existing arc flash study

Class Summary

Conducting an arc flash study to meet OSHA and NFPA 70E requirements can be daunting and costly; especially for large facilities. However, a large part of the cost is assembling the electrical data which is required for the study. It is critical that the proper data is collected keep the arc flash study updated. With proper direction, plant maintenance personnel can collect this information without the continued cost of hiring an outside vendor.

In this class, your personnel will receive an overview of arc flash study requirements, detailed review of each electrical component type and data to be collected. The data collections forms and one-line diagrams will be covered as will a basic introduction to overcurrent devices, fuse charts and time characteristic curves and how to properly document electrical data. As applicable, we will go into the facility to practice the documentation process.

This class covers in depth the theory of arc flash causes, a technical review of electrical theory of overcurrent protective devices, short circuit calculations and hazard mitigation. Various methods of calculating arc flash incident energies and boundaries are investigated along with their relative strengths and weaknesses. The importance of keeping warning labels and documentation current along with schemes to do so are explored. The input of various standards and their requirements are also considered.

Key Concepts

- Data Collection Requirements
- One-line diagrams
- Fuse Charts
- Breakers & Trip modules
- Naming conventions

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Creating & Maintaining a Comprehensive Electrical Safety Program

Course: E400

Length: 2 Hours
Text(s): NFPA 70E
Prerequisites: None
Certificate: Available
Exam: None
Format: Live or Web

Who Should attend

- Safety Personnel
- Engineering Managers
- Maintenance Supervisors/Managers
- Site/Plant Managers
- Corporate Safety Personnel
- Safety Committee/Team

Class Summary

Having a completed arc flash study does not mean that you have a comprehensive electrical safety program. It's a big part, but it's only the first step. In this class we will cover all aspects of a program including study and documentation maintenance, a written program, energized work permits and standard procedures, training and auditing.

It's a daunting task to have a truly "comprehensive" program, but this class will help you to systematically identify "first" things to put a program into place.

Key Concepts

- Conducting & Maintaining the Hazard Analysis (Arc flash study)
- Personal Protective Equipment Selection
- Written Electrical Safety Programs
- Written Electrical Safety Procedures
- On-going training programs
- Establishing & conducting annual audits

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