Module Overview

This module covers electrical shock and arc flash hazards and provides an introduction to *NFPA 70E®, Standard for Electrical Safety in the Workplace.*

Objectives

Upon completion of this module, the trainee will be able to do the following:

1. Identify electrical hazard types and locations, and explain related safety guidelines and terms.
2. Recognize and explain hazard boundaries.
3. Explain employer and employee responsibilities in recognizing and managing electrical hazards.
4. Identify common factors that lead to electrical incidents and explain the importance of using good judgment, appropriate procedures, and safe work practices.
5. Analyze the electrical hazards of a given task, plan the job, and complete an electrical work permit request.
6. Select, inspect, and maintain personal protective equipment (PPE) and test equipment used for electrical work.
7. Explain how to create an electrically safe work condition.

Performance Task

Under the supervision of the instructor, the trainee should be able to do the following:

1. Given a specific electrical task and circumstances, complete an energized electrical work permit request.

Materials and Equipment

Computer
Whiteboard/chalkboard
Markers/chalk
Pencils and paper
*NFPA 70E, Standard for Electrical Safety in the Workplace®*
Various types of protective equipment, including rubber gloves, leathers, rubber blankets, face shields, and arc flash suits
Various insulated/insulating and live-line tools
Temporary grounding jumpers
Insulated rescue hook
Blank energized electrical work request forms
Example job drawings
Time-current curves for various molded-case and low-voltage power circuit breakers (both thermal-magnetic operators and electronic trip units)
Molded-case and low-voltage circuit breakers
Insulation tester
Proximity detectors
Module Examinations*
Performance Profile Sheets*

* Download these materials from the IRC using your access code.

Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require that the trainees visit job sites. Ensure that trainees are briefed on site safety policies prior to any site visits.
Additional Resources

This module presents thorough resources for task training. The following resource material is suggested for further study.


*NFPA 70B-2010, Recommended Practice for Electrical Equipment Maintenance.* National Fire Protection Association: Quincy, MA.


Teaching Time For This Module

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 12½ hours are suggested to cover *Managing Electrical Hazards.* You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

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<td>B. Electrical Equipment, Including Specific Hazards Associated with Each Type</td>
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<td>D. PT/Laboratory</td>
<td>Have the trainees practice completing an energized electrical work permit request. This laboratory corresponds to Performance Task 1.</td>
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### Session IV. Analyzing Electrical Hazards; Electrical Test Equipment Selection and Use

A. Analyzing Electrical Hazards
   1. Drawings and Documents
   2. Shock Hazard Analysis
   3. Arc Flash Hazard Analysis
   4. Identifying Flash Protection Boundaries and Selecting PPE

B. Electrical Test Equipment Selection and Use
   1. Inspection
   2. Training
   3. Meter Use

### Session V. Establishing an Electrically Safe Work Condition; Emergency Response; Personal Safety Toolbox; Review and Testing

A. Establishing an Electrically Safe Work Condition
   1. Electrical Lockout/Tagout
   2. Hazardous Energy Control Procedures

B. Emergency Response
   1. Shock Victims
   2. Arc Flash Victims
   3. Teamwork
   4. Resuscitation

C. Personal Safety Toolbox
   1. Communication
   2. Changes in Scope
   3. Administrative Controls

D. Module Review

E. Module Examination
   1. Trainees must score 70 percent or higher to receive recognition from NCCER.
   2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

F. Performance Testing
   1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
   2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.