

## NFPA 70E

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Electrical power is a dangerous force that requires proper understanding in the workplace. This course defines the requirements for work practices that workers should use to avoid injury from a release of electrical energy when performing tasks involving electrical power. The specific information in this course enables the student to prevent or minimize exposure to all widely recognized electrical hazards as well as to better understand the importance of the relationship between OSHA and NFPA 70E.

### COURSE OUTLINE

#### Lesson 1 Topics

- OSHA Request for Electrical Safety Standard
- Birth of NFPA 70E
- NFPA 70E Scope
- NFPA 70E Intent
- OSHA Connection
- NFPA Importance
- Importance of Electrical Safety
- Layout and Review of NFPA 70E
- NFPA 70E Annexes

#### LESSON 2 Topics

- Safety Related Work Practices
- Organization

#### LESSON 3 Topics

- Chapter 1- Article 110
- Multiemployer Relationship
- Outside Contractors
- Training Requirements
- Type of Training Required
- Emergency Procedures Training
- “Qualified” Person Training Requirement
- Working within the Limited Approach Boundary
- Unqualified Person

#### LESSON 4 Topics

- Electrical Safety Program
- Job Briefing
- General Electrical Safety-Related Work Practices
- Electrical Hazard Analysis
- Shock Hazard Analysis
- Arc Flash Hazard
- Incident Energy

#### LESSON 5 Topics

- Transformer Current Ratings
- Available Bolted Fault Current
- Transformer Impedance
- Calculating Available Fault Current
- The Role of Circuit Breakers and Fuses in an Overload Condition
- Electromagnetically Operated Circuit Breaker

- Bi-Metallic Strip Operated Circuit Breakers
- Typical Circuit Breaker Installations
- Current Limiting vs. Non-Current Limiting Fuses
- Cycles Passed Through Equal Distance or Arc Blast
- Typical Cycles Passed
- Flash Hazard Analysis

#### **LESSON 6 Topics**

- Energized Electrical Work Permits
- Electrical Interlocks
- Test Instruments and Equipment
- Handling Portable Electrical Equipment
- Chapter 1- Article 120
- Verifying an Electrically Safe Work Condition
- Identifying Sources of Electrical Supply
- Opening Disconnecting Devices
- Applying Lockout/Tagout Devices
- Testing for the Absence of Voltage
- Grounding Phase Conductors or Circuit Parts

#### **LESSON 7 Topics**

- Lockout/Tagout
- Principles of Executing Lockout/Tagout
- Lockout/Tagout Plan
- Lockout/Tagout Devices
- Employer' Responsibility in a Lockout/Tagout Procedure
- Forms of Lockout/Tagout Control
- Who is in Charge of a Complex Lockout/Tagout Procedure
- Coordination of Lockout/Tagout Devices
- Review of Electrical Drawings
- Where to Install Lockout/Tagout Devices
- Procedural Elements of Control in a Lockout/Tagout Condition
- The Application of Lockout/Tagout
- When No Attachment is Available on a Disconnecting Means
- Use of Tagout only
- Removal of Lockout/Tagout Devices
- Release for Return to Service Test and Visual Inspectors

#### **LESSON 8 Topics**

- Working on or Near Live Parts
- Examples of Increased or Additional Hazards
- Examples of Infeasibility to De-Energize due to Equipment Design or Operational Limitations
- Energized Electrical Work Permit
- Approach Boundaries to Energized Parts
- Limited Approach Boundary (Shock Protection)
- Restricted Approach Boundary (Shock Protection)
- Prohibited Approach Boundary (Shock Protection Boundary)
- Factors Determining Shock Protection Approach Boundaries
- Flash Protection Boundary
- Flash Hazard Analysis
- Determining Flash Protection Boundary
- Arc Flash Labels and the NEC

- Type of PPE and Arc Flash Protection

#### **LESSON 9 Topics**

- Alternative Method of Determining Arc Flash FR Clothing and PPE
- Hazard/Risk Category Classifications
- Protective Clothing and PPE Matrix
- Protective Clothing and Equipment Minimum Requirements
- Typical Protective Clothing Systems
- Examples of Flash Suits
- Typical Arc Flash Protection
- 10 Reasons Why I Won't Wear an Arc Flash Suit When Required
- 1 Reason to Wear an Arc Flash Suit

#### **LESSON 10 Topics**

- General NFPA 70E Standards
- Insulated Tools and Equipment
- Work On or Near Un-insulated Overhead Lines
- General Safety Precautions Covered by NFPA 70E
- Conclusion

#### **SEAT TIME:**

The course has been approved for 4 hours.

#### **TESTING:**

All module quizzes require a 70% score to proceed forward in the course. The final exam must be passed with a 70% to receive a certificate of completion.