



## M&A Safety Services

512 Viaulet Road  
Youngsville, Louisiana 70592  
Main: 337-451-4685  
Fax: 337-451-5847  
[www.masafetyservices.com](http://www.masafetyservices.com)

### Electrical Safety (NFPA 70E) 4 Hour Course Outline

**Prerequisites:** This course shall have no formal pre-requisite.

**Course Length:** 4 hours – Course length shall vary depending on the number of delegates.  
Total course time includes breaks.

**Class Size:** The maximum number of delegates that may be trained and tested per instructor shall be thirty-five (35) in the classroom session.

#### Course Objective

- Provide delegates with the knowledge to safely perform work around energized and non-energized electrical equipment.
- Provide delegates with recommended practices and guidelines to perform safely while working with electricity.
- Delegates should be able to demonstrate knowledge during written examination.

#### Course Design

- Power Point© / Lecture / Audio Video / Visual Aids

#### Successful Course Completion

- Requires a minimum score of 75% or better.
- Grades shall be calculated by dividing the number of questions answered correctly by the total number of exam questions.
- Delegates will have no more than thirty (30) minutes to complete the exam.

#### Course Content Summary

- Classroom

**Breaks:** 10 minutes (approximately every hour)

**Lunch:** 1 Hour

#### Course Outline

Introduction

- Purpose
- Scope
  - Covered
  - Not Covered

## Safety Related Work Practices

- Definitions
  - Arc Flash Hazard
  - Boundaries
    - Arc Flash
    - Limited Approach
    - Restricted Approach
  - De-energized
  - Electrically Safe Work Condition
  - Fault Current
  - Fault Current Available
    - Figure 100.0 Available Fault Current
  - Incident Energy
  - Incident Energy Analysis
  - Nominal Voltage
  - Qualified Person
  - Risk Assessment
  - Working Distance
- Application of Safety-Related Work Practices and Procedures
  - Employer Responsibilities
  - Employee Responsibilities
- General Requirements for Electrical Safety-Related Work Practices
  - Electrical Safety Program
    - Inspection
    - Condition of Maintenance
    - Awareness and Self-Discipline
    - Electrical Safety Program Principles
    - Electrical Safety Program Controls
    - Electrical Safety Program Procedures
    - Risk Assessment Procedures
    - Human Error
    - Hierarchy of Risk Control Methods
      - Elimination
      - Substitution
      - Engineering Controls
      - Awareness
      - Administrative Controls
      - PPE
    - Job Safety Planning and Job Briefing
    - Incident Investigations



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- Auditing
- Lockout/Tagout Program
- Training Requirements
  - Initial Training
  - Retraining
  - Lockout/Tagout Training
  - Emergency Response Training
    - Contact Release
    - First Aid Training
- Establishing an Electrically Safe Work Condition
  - Lockout/Tagout Program
    - Definitions
    - The Fatal Five
    - What is LOTO?
    - Zero Energy State
    - The 4 E's to Energy Control
      - Energy
      - Engineering
      - Education
      - Enforcement
    - Energy
      - Kinetic
      - Potential
    - Hierarchy of Controls
      - Elimination and Substitution
      - Engineering
      - Administrative
      - Personal Protective Equipment
    - Employer/Employee Responsibilities
    - Training
    - Lockout Devices
      - Circuit Breaker Lockout
      - Valve Lockout
      - Plug Lockout
      - Pneumatic Plug Lockout
      - Wall Switch Lockout
      - Adjustable Cable Lockout
      - Hasp Lockout
      - Group Lock Box
    - Tagout

- Tagout Device
- Additional Training
- General Rules
- Lockout Tagout
  - Who can Lock Equipment?
  - Group LOTO
  - Outside Personnel
  - Shift or Personnel Changes
  - How to Perform LOTO Safely
- LOTO Procedures
  - Eight Steps for Lockout/Tagout
    - Step 1 – Determine All Possible Sources
    - Step 2 – Open the Disconnecting Device(s) for Each Source.
    - Step 3 – Wherever Possible, Visually Verify
    - Step 4 – Release Stored Electrical Energy
    - Step 5 – Release or Block Stored Mechanical Energy
    - Step 6 – Apply lockout/tagout devices
    - Step 7 – Test Each Phase Conductor or Circuit part
    - Step 8 - Ground the Phase Conductors or Circuit Parts
  - Start-up Guidelines
- Process Equipment and Piping Isolation Procedures
  - Purpose/Scope
  - Applications
  - Hazards
  - Responsibilities
  - Isolation Procedures
    - Double Block and Bleed
    - Slip Blind or Spectacle Blind
    - Blind Flange
- General Requirements
- Summary
- Work Involving Electrical Hazards
  - Electrically Safe Work Conditions
  - Infeasibility
  - Equipment Operating at Less Than 50 Volts
  - Normal Operating Condition
  - Energized Electrical Work Permit
    - When Required
    - Elements of Work Permit
  - Electric Shock



## **M&A Safety Services**

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- Common Electrical Hazards
- Effects of Electrical Current
- Prohibited Actions
- Common Mistakes That Lead to Electrical Hazards

### **Practical Session**

- None

### **Training Center Provided Material**

- Course Materials

### **Delegate Requirements**

- None

### **Reference Material / Documents**

NFPA 70E Standard (National Fire Protection Agency)

- 2018 Edition