



Continuing education for electrical workers to ensure and electrically safe work environment and work practices

I. Course Title:

NEC Article 250 (Grounding and Bonding)

II. Course Objective:

At the end of this class attendees will show increased knowledge and awareness of NFPA 70 (NEC) updates and current regulations, standards and industry best practices.

III. Course Drivers:

2014 NFPA 70, NFPA 70B

IV. Course Outcomes:

- a. Increased understanding of NFPA 70 (NEC) Article 250
- b. Awareness of error-traps in grounding and bonding installations that create unsafe conditions
- c. Show proficiency in navigating the NEC for grounding requirements when not found in Article 250
- d. Appropriate mitigation techniques where ground loops affecting low voltage applications are found
- e. Understand maintenance required for the grounding and bonding systems to ensure personnel safety and efficient operation of protective devices

V. Specific Learning Objectives:

- a. Understand grounding and bonding
 - i. For safety
 - ii. For reliability
 - iii. For lightning
 - iv. For static mitigation
 - b. Select appropriate wire sizes to achieve grounding and bonding
 - c. Recognize conditions that impede grounding and bonding
 - d. Understand fundamentals of grounding (earthing) and bonding
 - i. When to ground (earth), when not to grounds (earth)
 - ii. Grounding (earthing) of electrical systems
 - iii. Separately derived system equipment and _man bonding jumpers
 - iv. Grounding (earthing) electrodes and an electrode system
 - v. Grounding (earthing) electrode conductors
 - vi. Bonding of enclosures and equipment for operation of overcurrent devices
 - vii. Bonding of equipment grounding (bonding) conductors for personnel safety
 - viii. Safely clearing ground (earth) faults and short circuits
 - ix. Ground-fault protection for equipment
 - x. Grounding (earthing) and bonding for hazardous locations
 - xi. Low-voltage and intersystem grounding (earthing) and bonding
 - xii. Grounding (earthing) and bonding for over 600-volt systems
 - xiii. Grounding (earthing) and lightning considerations
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- e. Demonstrate knowledge of hazardous and non-hazardous location classifications
- f. Understand bonding of lightning grounding and electrical system grounding
- g. Determine appropriate maintenance required to ensure grounding and bonding system integrity

VI. Target Audience:

- a. Electricians
- b. Instrumentation technicians
- c. Electrical Engineers
- d. Operators of Electrical Systems

VII. Activity description

- a. Attendees show proficiency through class activities in navigating the NEC and achieving a minimum of 80% on the course subject quizzes and tests

VIII. Course Length:

Course can be tailored to meet client needs. Outcomes and Learning Objectives are not reduced while depth of class activity times are modified to meet time constraints

- a. 8 CEUs
Eight (8) hours of instructional time and activities within a single day
Updates to NFPA 70 (NEC) Article 250 are emphasized
- b. 16 CEUs
Sixteen (16) hours of instructional time and activities over two consecutive days
Updates to NFPA 70 (NEC), Article 250 and electrical installation, maintenance and safety are emphasized

NOTE: Check with your licensing agency for acceptance of LEE/WESS issued CEU's in your state