BII WORLD
Engage • Enlighten • Empower

NFPA
70E
Electrical Safety

Advanced Course conforms with NFPA 70E Requirements and Standards of OSHA 1910 Subpart S & OSHA 1926 Subpart K

- 50 Learning Topics
- 16 Hours Live Interactive Sessions
- Pre-course Preparation
- Classroom Assessment

- Videos & Exercises
- NFPA 70E Handbook (2021 Edition)
- Comprehensive Learning Kit
- Continuous Learning Validation Certificate

15 – 18 NOVEMBER 2022

09:00 - 13:30 ATLANTIC STANDARD TIME (AST)
13:00 - 17:30 GREENWICH MEAN TIME (GMT)

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Course Overview

Employers need to have robust safety plans in place how to keep employees safe in the workplace. The risks of shock, electrocution, arc flash, and arc blast still remain a significant health and safety concern for organizations though they have. According to NFPA, each week nearly three fatalities, and annually thousands are injured by electrical hazards. These incidents could have been prevented through compliance with the latest safety codes and standards.

NFPA 70E, Standard for Electrical Safety has become quintessential to reduce exposure to risks and reduce electrical injuries and fatalities. It was initially created to provide a document that meets the need of the Occupational Safety and Health Administration (OSHA). Now it helps companies and employees avoid workplace injuries and fatalities due to shock, electrocution, arc flash, and arc blast, and assists in complying with OSHA 1910 Subpart S and OSHA 1926 Subpart K.

This electrical safety training program is developed to train Electrical Engineers and Safety Specialist about the latest NFPA 70E standard. It also helps fulfill training requirements associated with OSHA compliance.

Learning Objectives

1. Understand Arc Flash, Arc Blast and Shock hazards
2. Understand what PPE to use and when
3. Understand Arc Flash Labels and requirements
4. Know the difference between Qualified and Unqualified person
5. Selection and precautions of multimeters
6. LOTO requirements
7. Hazard Risk Assessments for Shock and Arc Flash hazards
8. Understand Insulated tools and shielding materials

Benefits of Attending

For Employers
The course will give employers information on what they need to provide employees and why they need to provide it to reduce costly injuries and potential loss of customers and production.

For Employees
Employees will learn how to safely interact with electrical equipment. Learn what Arc Flash labels mean. Learn what PPE to use and when to use it to go home safe. Multimeter selection and precautions will be covered as well as insulated tools.

NFPA 70E Handbook for Electrical Safety in the Workplace
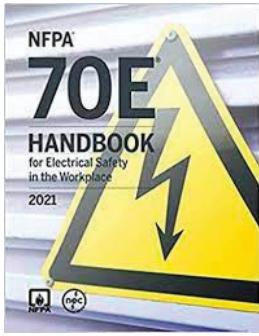
This book is essential for anyone with interest in ending electrical-related accidents, liability, and loss offers expert information on subjects ranging from safety-related work practices to special equipment and maintenance requirements.

Informative Annexes of this book provide in-depth coverage of personal protective equipment (PPE), developments in electrical design, risk assessment and control, human performance and electrical safety, and many other critical topics.

The new 2021 edition features extensive changes, including:

1. Revisions to Article 110 to incorporate the general requirements for electrical safety-related work programs, practices, and procedures from other articles

2. References to arc-resistant switchgear in Tables 130.5(C) and 130.7(C)(15)(a) changed to arc-resistant equipment to address the use of other types of arc-resistant equipment

3. Addition of Article 360, Safety-Related Requirements for Capacitors, and Annex R, Working with Capacitors, to address specific electrical safety requirements unique to capacitors

4. Edits to Annex D, Incident Energy and Arc Flash Boundary Calculation Methods, to reference IEEE-1584-2018 as a method of calculation

Who Should Attend?

Industries
- Oil and Gas
- Chemicals
- Mining
- Manufacturing
- Automobiles
- Aviation
- Food and Beverages
- Healthcare
- Hospitality
- Construction
- IT and Finance
- Government

HSSE Department
- Fire Safety Officer
- Fire Prevention Engineer
- Fire Code Enforcers
- Fire and Safety Manager
- Safety Manager
- Risk managers
- Loss Control Specialists
- Emergency Response Team
- HSSE Manager
- HSE Manager
- Law Enforcement Officials
- Fire Safety Consultants
- Facility managers

Operation Department
- Electrical Engineers
- Maintenance Supervisor
- Maintenance Staff
- Engineering Managers
- Plant Managers
- Operation Managers
- HVAC Technicians
- Solar & Wind Generator Installers/Maintainers
- Contractors & Consultants

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Brent Mollenhauer

CSP, CESCP

Certifications

1. Certified Safety Professional (CSP) awarded by Board of Certified Safety Professionals (BCSP), USA

2. Certified Electrical Safety Compliance Professional (CESCP) awarded by National Fire Protection Association (NFPA), USA

3. OSHA Authorized Construction Trainer awarded by Occupational Health & Safety Association (OSHA), USA

Profile Highlights

1. Brent is Electrical Safety Trainer and Compliance Auditor who delivers training globally on the standards of NFPA 70E and OSHA.

2. Prior to this, he was the contractor safety specialist for a large industrial facility.

3. He is also an OSHA Authorized Construction Trainer and has trained customers in numerous OSHA Safety topics.

4. He has also proudly served in the United States Marine Corps as a sergeant (E-5) and worked as a Field Wireman.

Training Methodology

1. Pre-Course Preparation:
   a. Pre-course questionnaire needs to be filled and submitted by the attendees before the online training. This will help the trainer to format the training as per attendees' understanding level and specific requirements.
   b. Pre-course materials and assignments will be provided by the trainer before the online training. Attendees need to study the material and submit the assignments before entering the online classroom.

2. Real Time Virtual Training: This course in principle does not differ to the direct presentation and assessment (face to face training). In 4-day classroom immersion, all the material in the original syllabus will be presented online as well as the tests.

3. Live Interactive Sessions: Polling, Q&A round will be provided to interact with the trainer online. Trainer will also be available post course to interact with the attendees.

4. Videos & Exercises: Live arc flash videos will be shown to both show what could happen and why we wear the clothing. There will be a few class exercises during the training.

5. Comprehensive Learning Kit: Trainer will provide course materials during/after the training which will be helpful for the attendees as the future reference in their continuous learning journey.

6. Break Down Day Timing:

Session 1	60 min
1st Break	10 min
Session 2	60 min
2nd Break	10 min
Session 3	60 min
3rd Break	10 min
Session 4	60 min

Continuous Learning Validation Certificate:

- This certificate will validate and certify the attendees' credibility shown in continuous learning.

- The attendees will receive soft copy of this certificate only after attending all the 4 days training.

Day 1

1. **Introductions**
   - Electrical Safety Training
   - OSHA – NFPA 70E
   - Electrical Safety History – How did we get here?

2. **Importance of Electrical Safety**
   - Video case study – arc flash survivor
   - Types of electrical hazards: Shock, arc flash, arc blast
   - Fatality Statistics
   - Where are we today vs 30 years ago and why?

3. **Effects of electrical shock on the body**
   - When can people sense shock?
   - What happens when someone gets locked on?
     i. Contact Release – best methods
     ii. What do we do after an electrical shock incident?
   - Paths electricity might take though the body and our defenses
   - What affects severity of shock injury?
   - Introduction to Ground Fault Circuit Interrupters

4. **Introduction to Arc Flash**
   - Protection from Arc Flash burns
   - Arc Rated Clothing vs Cotton clothing

5. **1st - 6th degree burns that could result from Arc Flash**
   - What happens to the skin with each?

6. **Main Reasons for and Arc Flash event.**

7. **What is the human body exposed to in an arc flash event?**

8. **Arc flash severity videos**
   - Videos showing the advantage of overcurrent protection

9. **The components of an Arc Flash Label and what do they mean**

10. **Arc Flash PPE**
    - What is worn for Category 0 - 4?
    - Video showing the importance of proper layering of clothing

11. **Discussion on "Dangerous" gear and our defense against Blast**

12. **OSHA 1910.331 – 335 Electrical Safety Related Work Practices Overview**
    - Scope
    - Training Requirements
      i. OSHA requirements for Qualified workers
      ii. Who should be trained?
    - Body position discussion
      i. What is proper when interacting with electrical equipment?
    - Overview of Lockout-Tagout
      i. Shutting Down Equipment
      ii. Restoring Equipment to service
    - Overhead Power Lines
      i. Distances and precautions
      ii. Vehicles and mechanical equipment near overhead power lines

13. **Test Instruments and Equipment**
    - What multimeter should I use?
    - Pre-use inspection of multimeter

Day 2

14. **OSHA requirements around Personal Protective Equipment**

15. **Alerting Techniques**
    - Signs, Barricades, Attendants

16. **Ensuring a Safe Workplace – Introduction to NFPA 70E**
    - What is NFPA 70E?
    - Technical Committee
    - Standard Layout

17. **Responsibilities**
    - Employer Responsibilities
    - Employee Responsibilities

18. **Hazard Elimination – Our #1 Priority**

19. **Electrically Safe Work Condition**
    - When do we need to de-energize?

20. **Energized work**
    - Requirements around justification for energized work.

21. **Normal Operating Condition**
    - What must be in place to interact with electrical equipment?

22. **Elements of an electrical safety program**
    - Risk assessments: Arc flash and shock risk assessments
    - Human Error and error reduction techniques
    - Hierarchy of Controls

23. **Job safety planning and job briefing**

24. **Auditing**
    - Program Audit
    - Field Work Audits

Day 3

25. Training Requirements

26. Qualified Person Training Requirements

27. Retraining Requirements

28. Emergency Response Training
   - Contact Release
   - First Aid, CPR, AED

29. Host and Contract Employers' Responsibilities

30. Corded Tools and Extension Cords

31. GFCI Requirements
   - We Areas
   - Maintenance Activities
   - Work outside

32. Electrical Safe Working Condition
   - Complex vs Single source LOTO

33. Establishing an Electrically Safe Work Condition
   - 8 step process
   - Detailed overview of using a multimeter for verification
     i. "live-dead-live"
   - Grounds

34. Energized Electrical Work Permit
   - Requirements
   - Exemptions to the permit

35. Shock Risk Assessment
   - AC/DC Shock tables
   - Shock Boundary Requirements

36. Arc Flash Risk Assessment
   - Look at Likelihood and severity of injury
   - Task Table 130.5(C)
   - Selecting appropriate PPE

37. Arc Flash Boundary
   - Specifically, what does it mean?

38. Incident energy analysis

39. Arc Flash label requirements

Day 4

40. **Personal Protective Equipment**
    - Videos comparing arc rated clothing vs other materials

41. **Shock PPE**
    - Testing Requirements

42. **Arc Rated Clothing fit and Care**

43. **Class Activity**
    - Arc Flash Risk Assessment: Tables Method
    - Arc Flash Risk Assessment: Incident Energy Analysis

44. **Insulated Tools**

45. **Barriers/insulating materials**

46. **Precautions**
    - Bling Reaching
    - Illumination
    - Conductive articles worn/used
    - Clear Working Space

47. **Cutting/Drilling**

48. **Removal/cutting of conductors**

49. **Chapter 2 overview**
    - Maintenance of equipment
    - NFPA 70B
    - Single Line Diagrams

50. **Chapter 3 – Safety Requirements for Special Equipment**
    - Overview of Special Equipment
    - Capacitors
        i. Thresholds
        ii. Written Procedures
        iii. Grounding Sticks

51. **Informative Annexes**
    - Overview of each of the annexes

FAQs

Does BII Online Virtual Training have the same value as traditional classroom training?

Yes, BII Online Virtual Training offers participants; same training system as in-person, i.e face-to-face engagement with instructors, course material, interactive participation of all delegates, and personal support that they would expect to find in a traditional classroom.

What are main features of your online courses? Are they on-demand? Is it different content from the in-person offering?

The content of the virtual training is similar to the in-person sessions and customized presentation makes it a richer online learning experience. As always, we will share presentation materials with attendees for later reference.

The online courses are not on-demand and recordings cannot be purchased. They are set on scheduled dates, live with an instructor and co-host via webinar software. While the day is shorter than an in-person session (4hrs vs 8hrs), timing are adjusted to accommodate attendees in different time zones and allow more time for one-on-one conversations via the Q & A.

What are the technical requirements for participation in a virtual course?

All you need to participate in virtual training are:
• Desktop or Laptop or Tablet Computer, and Internet connection
• Webcam
• Headset with built-in microphone

Can I attend an online training session if I have a Macintosh computer?

Yes, Our Online training systems does allow Macintosh computers, PCs, and computers running Linux to easily enter any of our online training sessions.

What type and version of browser will I need for online classes?

It is recommended that you use the latest version of Firefox, Chrome or Internet Explorer for Windows and Firefox or Safari for Mac. Each of these is available for free download and also suggested you have the PDF Reader

How do I have access to the trainer for questions?

As in the classroom, you will see the trainer in front of you and have the opportunity to ask questions at any time - all via audio and video transmission.

Is there a mute option within an online training session to minimize background noise from my audio connection?

Yes, the Mute button will display to the right of your name as you hover your mouse over your name shown in the Participants panel on the top, right side of the Web conferencing screen.

Do I get a Certificate at the end?

Yes, you will get a PDF version of your certificate of completion