COURSE OVERVIEW EE1121
NFPA 70 AND 70E: NEC Workplace Electrical Safety

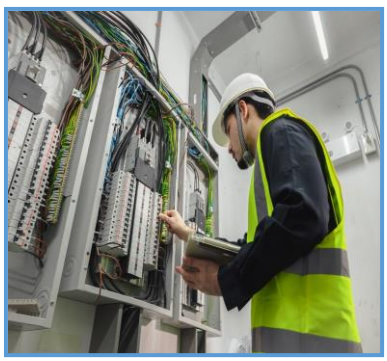
Course Title
NFPA 70 AND 70E: NEC Workplace Electrical Safety

Course Date/Venue
Batch 1: November 16-20, 2025/Meeting Plus TBA, City Centre Rotana Doha Hotel, Doha, Qatar
Batch 2: November 23-27, 2025/Meeting Plus TBA, City Centre Rotana Doha Hotel, Doha, Qatar

Course Reference
EE1121

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description



This practical and highly-interactive course includes various practical sessions and. Theory learned will be applied using our state-of-the-art simulators.

This course is designed to provide participants with a detailed and up-to-date overview of NFPA 70 AND 70E: NEC Workplace Electrical Safety. It covers the distinguishing between NEC (NFPA 70) and workplace safety (NFPA 70E); the principles of electricity, common electrical faults, danger zones and exposure points; the root causes and contributing factors, human error and behavior-based safety implications and the importance of learning from near-miss reports; the components of an effective electrical safety program (ESP), safety goals, policies, and performance indicators; the coordination between engineering and HSE departments and audit and continuous improvement mechanisms; the electrical shock hazards, arc flash hazards, arc blast and related hazards; and the limited, restricted and prohibited approach boundaries.

Further, the course will also discuss the risk assessment procedure by identifying hazards and assessing risk levels, job safety planning and risk evaluation and hierarchy of risk controls; the energized electrical work permits (EEWP) covering components and approval process of EEWP, coordination with management and operations and documentation and retention requirements; the safe equipment design and installation (NEC compliance), personal protective equipment (PPE) selection, labeling and signage requirements and tools and testing equipment safety; and the lockout/tagout procedures (LOTO), preventive maintenance schedules, infrared thermography and condition monitoring and record-keeping and compliance tracking.

During this interactive course, participants will learn the company specific electrical safety concerns, safe work practices, emergency response planning and electrical safety auditing; the root cause analysis (RCA) for electrical incidents, enhancing safety through training and awareness and regulatory compliance and global best practices; the de-energization hierarchy and justification, verification of zero energy state, temporary protective grounds and safe re-energization procedures; the step-by-step procedure to achieve ESWC, verification tools and techniques, documentation of ESWC completion and reinstating normal operations safely; and the contractor and third-party coordination covering safety expectations from electrical contractors, pre-job safety meetings and permits, lockout-tagout synchronization and responsibility sharing and reporting.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain an in-depth knowledge on NEC and workplace electrical safety in accordance with NEC and NFPA 70 and 70E
- Distinguish between NEC (NFPA 70) and workplace safety (NFPA 70E) and discuss the principles of electricity, common electrical faults, danger zones and exposure points
- Identify root causes and contributing factors, human error and behavior-based safety implications and the importance of learning from near-miss reports
- Recognize the components of an effective electrical safety program (ESP), safety goals, policies, and performance indicators, coordination between engineering and HSE departments and audit and continuous improvement mechanisms
- Describe electrical shock hazards, arc flash hazards, arc blast and related Hazards and limited, restricted, and prohibited approach boundaries
- Apply risk assessment procedure by identifying hazards and assessing risk levels, job safety planning and risk evaluation and hierarchy of risk controls
- Discuss energized electrical work permits (EEWP) covering components and approval process of EEWP, coordination with management and operations and documentation and retention requirements
- Carryout safe equipment design and installation (NEC compliance), personal protective equipment (PPE) selection, labeling and signage requirements and tools and testing equipment safety
- Employ lockout/tagout procedures (LOTO), preventive maintenance schedules, infrared thermography and condition monitoring and record-keeping and compliance tracking
- Discuss company specific electrical safety concerns and apply safe work practices, emergency response planning and electrical safety auditing
- Carryout root cause analysis (RCA) for electrical incidents, enhance safety through training and awareness and apply regulatory compliance and global best practices
- Determinate de-energization hierarchy and justification, verification of zero energy state, temporary protective grounds and safe re-energization procedures

- Illustrate step-by-step procedure to achieve ESWC, verification tools and techniques, documentation of ESWC completion and reinstating normal operations safely
- Apply contractor and third-party coordination covering safety expectations from electrical contractors, pre-job safety meetings and permits, lockout-tagout synchronization and responsibility sharing and reporting

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of NFPA 70 and 70E: NEC workplace electrical safety for plant & facility managers, supervisors, foremen, and safety managers, electricians & electrical technicians, maintenance workers & facilities technicians, engineers (electrical, mechanical, etc.), construction workers, qualified persons (as defined by NFPA 70E), apprentices & trainees, contractors & subcontractors and anyone involved in lockout/tagout (LOTO) procedures.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Fee

US$ 6,000 per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Steve Mark, PE, MSc (on-going), BSc, is a **Senior Electrical & Telecommunications Engineer** with over **20 years** of extensive experience within the **Oil & Gas**, **Petrochemical** and **Power** industries specializing in **Certified Electrical Safety Compliance Professional**, Safety Instrumented Systems (**SIS**), Safety Integrity Level (**SIL**), **Overhead Power Line Maintenance Patrolling & Washing**, **Energy Transmission & Distribution**, **Transmission Line** Structures, **Insulators & Accessories**, **Transmission Line Construction & Maintenance**, **Insulated Power Cables**, **High Voltage Applications**, **Transmission Line Parameters**, **Sag & Tension of Conductor**, **Geomagnetic Disturbances**, **Reactive Power Compensation**, **Overhead Line Troubleshooting**, **Patrolling**, **Troubleshooting Safety**, **HV/LV Equipment**, **High Voltage Electrical Safety**, **LV & HV Electrical System**, **HV Equipments Inspection & Maintenance**, **HV Switchgear Operation & Maintenance**, **LV Distribution Switchgear & Equipment**, Basic **Electricity**, **Electrical & Special Hazards**, **Personnel Protection**, **Motor Controllers**, **Electrical Switching Practices**, **Emergency Planning**, **Safety Management**, **Earthing & Bonding Installation**, **Energized & De-Energized Work**, **Protection Relays**, **Testing & Commissioning**, **Lock & Tag Out**, **Circuit Breakers & Switchgears**, Portable **Cables**, **Transformers**, **Surge Arrestors**, **Isolators & Fuses**, **Capacitor Banks**, Earth & Shunt Reactors, Gas Insulated Substations (**GIS**), **HV Substation Inspection & Reporting**, **HV Cable Design**, **HV Electrical System Commissioning**, **HV Equipments Inspection & Maintenance**, **UPS & Generators**, Electrical Installations Design & Construction, **Electrical Mechanical Installations**, **GIS Substations**, **GE Turbine Power Plant** and **Steam Power Plants**. Further, he is also well-versed in **Network & System Administration**, Data/Voice Networking, Network Capacity Calculations, VPN Connection Implementation, Structured Cabling Constructions, Engineering Design, Security Installations Design & Implementation, Logistics Management, IT Analysis, Business Continuity Plan Design, Disaster Recovery Simulations, Supply Chain System Design, Barcode Marking & RFID Applications. He is currently the **Lead Electrical Engineer** of Public Power Corporation S.A wherein he is responsible for site manufacturing supervision of works and electrical maintenance support for the existing Steam Electrical Power Plant.

During his career life, Mr. Mark has gained his expertise and thorough practical experience through handling challenging positions such as being the **IT & Telecommunications Manager**, **IT & Organization Manager**, **Logistics Manager**, **Electrical Engineer**, **Safety Engineer**, **Public Works Contractor**, **IT Support Analyst**, **Project Supervisor**, **Systems & Network Administrator**, **Data Protection Officer**, Shop Auditor and Amateur Radio Operator for various multi-national companies and institutes.

Mr. Mark is a **Registered Professional Engineer**, has a Bachelor degree in **Electrical Engineering** from the **Technical University of Halkida**, **Euboea**, **Greece** and currently enrolled for **Master** degree in **Quality Management** from the **Hellenic Open University**. Further, he is a **Certified Instructor/Trainer**, a **Certified Safety Engineer** and a **Certified Data Protection Officer** (**DPO**). Moreover, he is a member of Scientific Society of Technological Education of Engineers (EETEM) and has delivered numerous trainings, courses, seminars, workshops and conferences internationally.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction to NFPA Standards & Objectives*** *Understanding the Structure and Purpose of NFPA 70 & 70E • Distinguishing Between NEC (NFPA 70) and Workplace Safety (NFPA 70E) • Key Terminology and Definitions Used in the Standards • Overview of Electrical Safety Culture in the Industry*
0930 – 0945	*Break*
0945 – 1045	***Electrical Safety Fundamentals*** *Principles of Electricity: Voltage, Current, Resistance, and Power • Common Electrical Faults: Short Circuits, Ground Faults, Arc Faults • Recognizing the Danger Zones and Exposure Points • Electrical Hazard Recognition Methods*
1045 – 1130	***Understanding NFPA 70 (National Electrical Code)*** *Purpose and Scope of NEC in Electrical Installations • Code Arrangement and Layout (Chapters 1–9) • Wiring Methods, Conductor Properties, and Overcurrent Protection • Relationship Between NEC and Local Regulations*
1130 – 1230	***Basic of NFPA 70E*** *Scope and Intent of NFPA 70E for Workplace Safety • Definitions of Hazard, Risk, Incident Energy, and Arc Flash • Linkage Between OSHA Requirements and NFPA 70E • Role of Management, Safety Officers, and Engineers in Implementation*
1230 – 1245	*Break*
1245 – 1330	***Realities of Electrical Accidents*** *Case Studies of Electrical Injuries and Fatalities in Process Industries • Root Causes and Contributing Factors • Human Error and Behavior-Based Safety Implications • Importance of Learning from Near-Miss Reports*
1330 – 1420	***Building a Proactive Electrical Safety Program*** *Components of an Effective Electrical Safety Program (ESP) • Safety Goals, Policies, and Performance Indicators • Coordination Between Engineering and HSE Departments • Audit and Continuous Improvement Mechanisms*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Electrical Shock Hazards*** *Mechanism of Electrical Shock • Shock Thresholds and Effects on the Human Body • Protection Strategies: Insulation, Grounding, GFCI • Rescue Procedures and First Aid for Shock Victims*
0830 – 0930	***Arc Flash Hazards*** *What is Arc Flash and How It Occurs • Incident Energy and Arc Flash Boundary Concepts • PPE Category System and Risk Severity • Equipment Labeling for Arc Flash Protection*
0930 – 0945	*Break*
0945 – 1100	***Arc Blast & Related Hazards*** *Arc Blast Forces and Heat Effects • Hazardous Sound Levels and Pressure Waves • Secondary Injuries and Fire Risks • Protection by Design and Safe Work Methods*
1100 – 1230	***Approach Boundaries (NFPA 70E Table 130.4)*** *Limited, Restricted, and Prohibited Approach Boundaries • Determination and Implementation in Electrical Tasks • Role of Qualified vs. Unqualified Personnel • Controlling Access to Hazardous Zones*
1230 – 1245	*Break*
1245 – 1330	***Risk Assessment Procedure (Article 110)*** *Identifying Hazards and Assessing Risk Levels • Job Safety Planning and Risk Evaluation • Hierarchy of Risk Controls • Task-Based versus System-Based Assessments*
1330 – 1420	***Energized Electrical Work Permits (EEWP)*** *When Energized Work is Permitted • Components and Approval Process of EEWP • Coordination with Management and Operations • Documentation and Retention Requirements*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3:

0730 – 0830	***Safe Equipment Design & Installation (NEC Compliance)*** *Requirements for Equipment Spacing and Accessibility • Enclosure Types and Ingress Protection (IP Codes) • Protection from Physical Damage and Moisture • Selection of Disconnects and Circuit Protection*
0830 – 0930	***Personal Protective Equipment (PPE) Selection*** *PPE Categories Based on Arc Flash Risk • Insulated Gloves, Face Shields, Arc-Rated Suits • Care, Inspection, and Storage of PPE • NFPA 70E Tables 130.5(G) & 130.7(C)(15)(C) Use*
0930 – 0945	*Break*
0945 – 1100	***Labeling & Signage Requirements*** *Equipment Labeling for Arc Flash and Shock Hazard • Label Format, Content, and Maintenance • Field Labeling versus Factory Labeling Responsibilities • Practical Demonstration and Interpretation of Labels*
1100 – 1230	***Tools & Testing Equipment Safety*** *Selection and Rating of Insulated Tools • Testing and Calibration of Voltmeters, Testers • Use of Live-Dead-Live Test Procedures • Control of Tools and Equipment Maintenance Logs*

1230 – 1245	*Break*
1245 – 1330	***Lockout/Tagout Procedures (LOTO)*** *LOTO Process in Electrical Maintenance • Isolation Verification and Coordination • Control of Stored Energy • Common LOTO Violations and How to Prevent Them*
1330 – 1420	***Maintenance Requirements (NFPA 70E Chapter 2)*** *Importance of Maintaining Safety-Related Systems • Preventive Maintenance Schedules • Infrared Thermography and Condition Monitoring • Record-Keeping and Compliance Tracking*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4

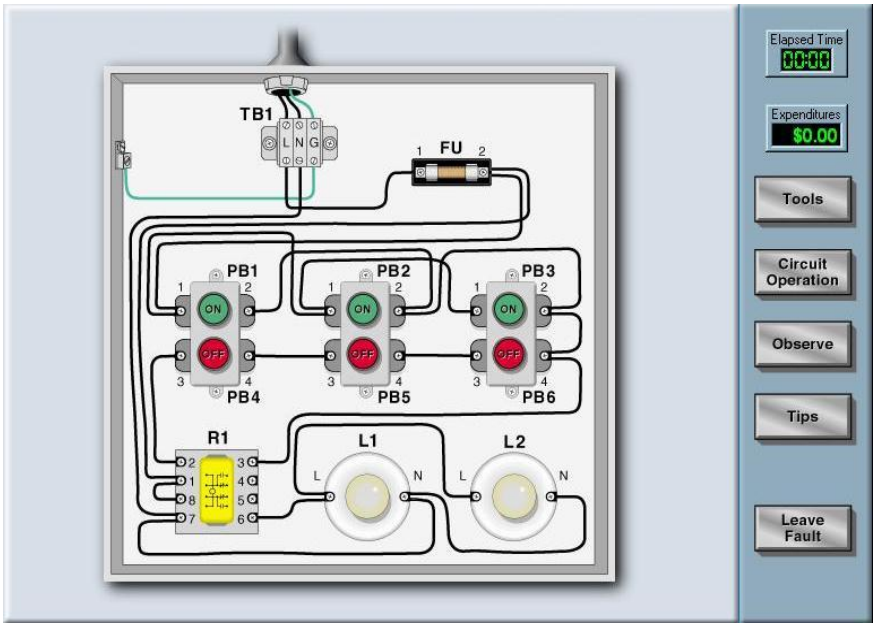
0730 – 0830	***Company-specific Electrical Safety Concerns*** *Environmental and Chemical Exposure Risks • Corrosion-Prone Environments and Insulation Degradation • Integration with Process Safety Systems (DCS, PLCs) • Earthing and Bonding Practices in Fertilizer Plants*
0830 – 0930	***Safe Work Practices*** *Work on or Near Live Parts • Remote Racking and Switching • Temporary Protective Grounding • Switching Orders and Authorization Systems*
0930 – 0945	*Break*
0945 – 1100	***Emergency Response Planning*** *Electrical Fire Safety and Extinguisher Use • Emergency Shutdown Procedures • Communication Plans and Escape Routes • Coordination with Plant Emergency Response Team*
1100 – 1230	***Electrical Safety Auditing*** *Internal versus External Audits • Audit Checklists and Interview Methods • Frequency and Documentation of Findings • Corrective and Preventive Actions Tracking*
1230 – 1245	*Break*
1245 – 1330	***Root Cause Analysis (RCA) for Electrical Incidents*** *Tools: 5 Whys, Fishbone Diagrams, FMEA • Applying RCA to Arc Flash and Equipment Failure • Human Factors and Procedural Gaps • Implementing Recommendations and Follow-Up*
1330 – 1420	***Enhancing Safety through Training & Awareness*** *Training Matrix and Role-Based Competency Development • Simulation and E-Learning Methods • Engaging Toolbox Talks and HSE Campaigns • Evaluating Training Effectiveness and Retention*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

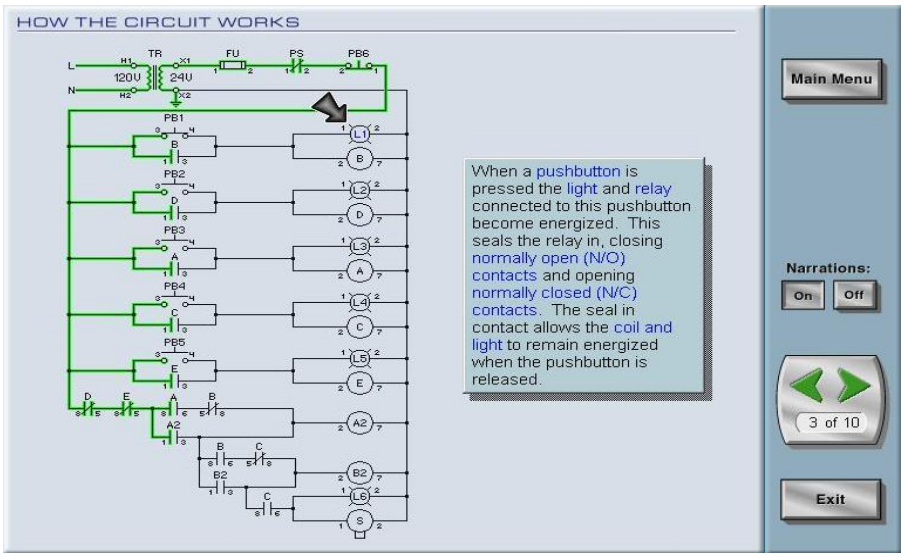
Day 5

0730 – 0830	***Regulatory Compliance & Global Best Practices*** *OSHA versus NFPA: Comparison and Alignment • IEC Standards and Gulf Region Practices • Importance of Documentation and Traceability • Integrating Safety into Design and Procurement*
0830 – 0930	***Energy Control Programs (Article 120)*** *De-Energization Hierarchy and Justification • Verification of Zero Energy State • Temporary Protective Grounds • Safe Re-Energization Procedures*
0930 – 0945	*Break*
0945 – 1100	***Electrically Safe Work Condition (ESWC)*** *Step-by-Step Procedure to Achieve ESWC • Verification Tools and Techniques • Documentation of ESWC Completion • Reinstating Normal Operations Safely*
1100 – 1230	***Contractor & Third-Party Coordination*** *Safety Expectations from Electrical Contractor • Pre-Job Safety Meetings and Permits • Lockout-Tagout Synchronization • Responsibility Sharing and Reporting*
1230 – 1245	*Break*
1245 – 1345	***Final Workshop & Case Study Review*** *Review of Incidents and Applied NFPA 70E Principles • Mock Job Hazard Analysis and Risk Assessment • Group Presentations on Improvement Ideas • Final Q&A and Troubleshooting Challenges*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulators (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art "Troubleshooting Electrical Circuits V4.1 Simulator" and "Lab Volt Testing Device".





Troubleshooting Electrical Circuits V4.1 Simulator

Lab Volt Testing Device

Course Coordinator

Reem Dergham, Tel: +974 4423 1327, Email: reem@haward.org