Electrical Safety in the Workplace: Arc Flash, Shock Protection and Safe Isolation

1 – 5 March 2027
Dubai - Five-star CBD venue



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Introduction:

Electrical safety in the workplace fails in predictable ways: a conductor assumed dead that was never tested, an arc flash during racking with no incident energy known, a crane boom drifting towards an overhead line, a damaged cord on temporary power. This Core Concept course trains the people who switch, isolate, maintain and supervise electrical equipment to control shock, arc flash and arc blast hazards using the NFPA 70E risk assessment approach. Through inspection walkthroughs of switchrooms and site power, participants build an Electrical Safe Work Procedure Pack for their own installation.

Course Objectives:

- Identify shock, arc flash and arc blast hazards on electrical equipment and record them in a site electrical hazard inventory
- Apply the NFPA 70E shock and arc flash risk assessment to set approach boundaries, incident energy and protective measures for a task
- Establish and verify an electrically safe work condition, including absence of voltage testing and temporary protective grounding
- Select arc-rated clothing and insulating protective equipment from equipment labels and task conditions
- Control energised work, switching, overhead line proximity and temporary power through permits, schedules and inspections
- Investigate an electrical incident and produce an Electrical Safe Work Procedure Pack for a real installation

Target Audience:

- Electricians and electrical technicians who isolate, test and maintain low and medium voltage equipment
- Electrical supervisors who plan switching, authorise work and lead maintenance crews
- Shift operators who rack breakers, operate switchgear and restore supplies
- HSE officers who inspect electrical work practices and investigate electrical incidents
- Maintenance planners who schedule outages and prepare electrical work packages

Course Outline:

Day 1: Electrical Hazards and the Electrical Safety Program

- Electric Shock Physiology: Current Path, Let-Go Threshold and Ventricular Fibrillation
- Arc Flash and Arc Blast Mechanisms: Radiant Heat, Pressure Wave and Molten Metal
- Frequent Causes of Electrical Injury: Power Line Contact, Missing Ground-Fault Protection and Damaged Cords
- Electrical Safety Program Elements: Policy, Qualified Persons, Procedures and Program Audits
- Site Electrical Hazard Inventory Using a Switchroom and Distribution Board Checklist

Day 2: NFPA 70E Risk Assessment, Approach Boundaries and Incident Energy

- NFPA 70E Work Practice Structure and the Hierarchy of Risk Controls
- Shock Risk Assessment: Limited and Restricted Approach Boundaries
- Arc Flash Risk Assessment: Incident Energy in cal/cm2 and the Arc Flash Boundary
- IEEE 1584 Calculation Inputs: Bolted Fault Current, Clearing Time and Working Distance
- Arc Flash Equipment Labels and the PPE Category Method

Day 3: Establishing an Electrically Safe Work Condition

- Electrically Safe Work Condition Sequence: Source Identification, Disconnection and Visible Open Points
- Electrical Isolation Devices: Racking Out Breakers, Withdrawing Fuses and Applying Personal Locks
- Absence of Voltage Testing with Live-Dead-Live Tester Proving
- Temporary Protective Grounding Placement and Discharge of Capacitors and Cables
- Arc-Rated Clothing, Insulating Gloves and Face Shields: Selection by Incident Energy and Voltage Class

Day 4: Energised Work, Switching and Field Exposures

- Energised Electrical Work Permit: Justification, Hazard Analysis and Approval Criteria
- Written Switching Schedules, Remote Racking and Operator Body Positioning
- Overhead Power Line Proximity: Clearance Planning for Cranes, Excavators and Scaffolds
- Temporary Power and Portable Equipment: Residual Current Devices, Flexible Cords and Portable Appliance Testing
- Electrical Incident Investigation: Evidence Preservation, Arc Damage Reading and Root Cause Analysis

Day 5: Inspection Walkthroughs and the Electrical Safe Work Procedure Pack

- Switchroom Inspection Walkthrough: Label, Boundary and Protective Equipment Verification
- Electrically Safe Work Condition Walkthrough on a Motor Control Centre Feeder
- Temporary Site Power Walkthrough: Distribution Boards, Earthing and Cord Condition
- Electrical Safe Work Procedure Pack Drafting
- Peer Review of Procedure Packs Against the NFPA 70E Risk Assessment Steps

Skills You Will Gain:

- Electrical Hazard Recognition
- Shock Risk Assessment
- Arc Flash Risk Assessment
- Incident Energy Interpretation
- Voltage Absence Verification
- Switching Schedule Preparation
- Arc-Rated PPE Selection
- Electrical Incident Analysis

Why Attend This Course:

- Return with an Electrical Safe Work Procedure Pack for a real installation, checked in inspection walkthroughs
- Read an arc flash label and turn it into boundaries, protective equipment and a go or no-go decision for a task
- Know when energised work cannot be justified and how to put the equipment into an electrically safe work condition instead
- Compare electrical work practice with electricians and supervisors from utilities, oil and gas, manufacturing and buildings

Conclusion:

Electrical injuries are prevented by tested isolation, known incident energy and disciplined switching, not by warning signs. This course moves from shock, arc flash and arc blast mechanisms and the electrical safety program, through NFPA 70E risk assessment, approach boundaries and IEEE 1584 inputs, to establishing an electrically safe work condition and selecting protective equipment, then on to energised work permits, switching, overhead lines, temporary power and incident investigation. The final day applies the material in inspection walkthroughs and produces an Electrical Safe Work Procedure Pack.