
Practical

ELECTRICAL SAFETY TECHNIQUES

for Industry



WHAT YOU WILL GAIN FROM THIS WORKSHOP

- Learn how to protect yourself and others from electrical hazards
- Identify electrical hazards when doing maintenance work
- Learn about best practice in electrical design for safety
- Identify key electrical safety parameters
- Apply electrical safety to hazardous areas
- Gain know-how in the UK Standards that apply to electrical safety
- Learn the key procedures in safe electrical working
- Learn about regular periodic inspection and planned maintenance for safe operation of electrical equipment
- Learn how to conduct an electrical safety audit and ensure your plant is in compliance
- Learn how to report accidents, carry out investigations and determine measures to improve safety



Technology Training that Works

THE WORKSHOP

A number of serious accidents and fatalities occur every year in industry due to accidents involving electricity, taking a huge financial and human toll. The dangers and risks from electrocution, shock, explosions and arc blast can never be eliminated but you can take definite steps to protect yourself and your co-workers. Safety should be built into the design of electrical equipment and followed up with proper installation, operation, maintenance and periodic inspection.

Electrical safety is not just a technical issue. Accidents can only be prevented if appropriate safety procedures are developed and enforced. This includes complete familiarity with equipment and systems often imparted through structured training to each and every person who operates or maintains the equipment.

In this workshop, we will take a look at the theoretical aspects of safety as well as the practical issues including the statutory and safety-training related aspects. This know-how will certainly enable participants to deploy appropriate safety procedures in their workplace and improve their safety record.

ON-SITE TRAINING

- ✓ **SAVE** over 50% by having an IDC workshop presented at your premises.
- ✓ Customise the training to **YOUR** workplace.
- ✓ Have the training delivered when and where you need it.

Contact us for a **FREE** proposal.

THE PROGRAM

DAY ONE

INTRODUCTION

PRINCIPLES OF SAFETY RULES

- Electrical hazards
- Requirements for safety
- Operative training
- Personnel levels of competency
- Safety documentation
- Work on live systems, close to live systems

ELECTRICAL SHOCK AND METHODS OF SHOCK PREVENTION

- Shock - direct and indirect contact
- Touch and step potential
- Effects of shock on the human body
- The deadly combination of heights and electric shock
- Locations of increased shock risk
- Principles of shock protection
- First-aid for burns and electric shock
- Earth leakage circuit breakers
- Role of electrical insulation in safety

HAZARDS DUE TO ELECTRICAL ARCING AND HEATING

- Arc flash definition
- Arc blast
- Hazards due to arcing/flashover
- Effects of arc flash on human
 - Physiological effects
 - Tissue damage
 - Internal organ damage
 - Burns
 - Fibrillation
 - Curable 2nd degree burn
 - Arc blast pressure and sound pressure
- Reducing arc-flash hazard
 - Minimise risk with good safety practices
 - Considerations for new equipment
 - Reduce the available fault current
 - Increasing worker distance
 - Faster tripping time
- Hazards from use of electrical equipment in explosive environment
- Hazards due to high temperature in electrical equipment

STATIC ELECTRICITY AND PROTECTION

- What is static electricity?
- Generation of charge
- Common examples of static build up
- Energy of spark and its ignition capability
- Dangers of static electricity buildup
- Control of static electricity
- Static electricity danger in un-energized overhead lines
- Assessment of static risks and planning prevention

SAFETY ASPECTS IN ELECTRICAL EQUIPMENT DESIGN AND SELECTION

- Design of equipment for ensuring safety
- Equipment ratings and fault withstand capability
- Containing and deflecting arcs during equipment faults
- Role of equipment enclosures in ensuring safety-discussion on motor terminal boxes as an example
- Degree of protection and its significance in safety
- Damage due to overload or excessive fault current in electrical conductors
- Types of insulation and their temperature limits
- Protecting electrical systems by over current protective devices (relays, releases, fuses and circuit breakers)
- Detection of hot spots by infrared sensors or viewing devices
- Equipment selection-its contribution to safe operations
- In-built earthing devices and interlocks
- Special requirements to be observed in restrictive conductive locations

DAY TWO

SAFE OPERATION AND MAINTENANCE OF ELECTRICAL EQUIPMENT

- Key safety issues in O&M of electrical installations
- Policies of operational and safety locking, safety notices and remote operation
- Use of warning signs for operation and maintenance
- Personnel protective equipment
- Work on underground cable systems
- Use and upkeep of safety appliances in substations and other electrical premises
- Gas safety and ventilation
- Switching schedules
- Electrical testing procedures
- Periodic inspection and maintenance for safe operation of electrical equipment

EARTHING AND BONDING

- Objectives of earthing
- Earthing of power supply systems and its safety implications
- Role of earthing of equipment enclosures (protective earthing) in human safety
- Neutral earthing of electrical supply systems
- Thermal capability
- Use of protective metallic conduits for earthing conductors
- Objectives of bonding
- Equipotential bonding

SUBSTATION SAFETY

- Safety while working in outdoor switchyards and overhead lines
- Special precautions when working on switchgear
- Substation check list
- Fire protection in substations

SAFETY IN BATTERY INSTALLATIONS

- Hazards involved in lead-acid battery installations
- Premises used for housing lead acid batteries
- Transportation and storage
- Installation and commissioning
- Charging and storage
- Dismantling and disposal
- Protective clothing

REGULATIONS GOVERNING WORKPLACE SAFETY

- Safety-related legislation
- Special regulations for hazardous areas
- Codes of practice (non-mandatory guidelines)
- Standards (IET/IEE, IEEE, NFPA)

ORGANISATIONAL REQUIREMENTS OF SAFETY

- Statutory requirements for working in electrical installations
- Competency and authorisation
- Responsibility of employer and employee in regard to electrical safety at work
- Safety organisation within the company
- Accident reporting, investigation, analysis and prevention
- Safety awareness promotion among workforce and importance of appropriate training

SUMMARY, OPEN FORUM AND CLOSING