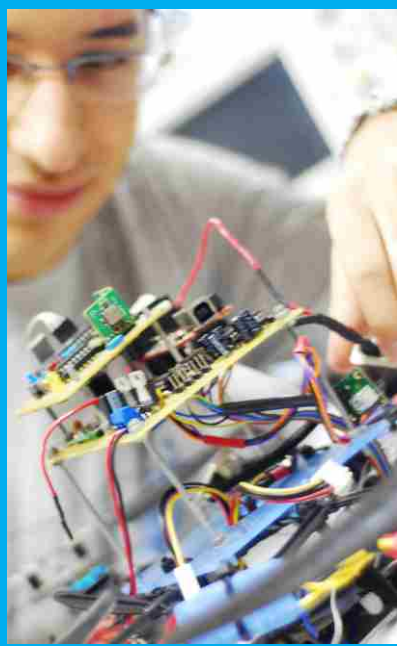


FUNDAMENTALS OF **ELECTRICAL SAFETY TECHNIQUES** for Industry



What You

Will Learn...

- 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

Course

STRUCTURE



“I would like to thank T&P Team of Smartbrains who helped me to get skill set on Electrical System Design. The learning experience was good and placement is excellent”

Zeeshan Ahmad

Ankit Electrotech Engineers Pvt Ltd, Noida

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

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

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

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

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

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

SmartBrains Oil and Energy Institute provides premium training courses for energy industry executives and fresh engineering graduates. Our success and distinguished reputation is thanks to our commitment to provide first-class programmes to our clients. Combining leading professionals from across the industry as lecturers and an interactive, practical format, the lessons learnt in a SmartBrains for Energy course are directly transferable back to the work place.

Our Strategic Objectives

To be recognized by industry and employers as a highly reputable training organization. Provide dynamic leadership, sound management and excellence in training. Continue to improve our services through quality management processes. Invest in and value our people through professional development activities. Grow our business through innovation and to continue to be financially secure. Be influential in the economic development of the industries we serve nation wise

Admission Requirements

- ▶ Duly Filled Application Form
- ▶ 2 Photographs
- ▶ Photo State of Qualifying Examination
- ▶ Address Proof
- ▶ I.D. Proof
- ▶ Latest Resume



Our Mission

“To provide quality training and assessment services and to prepare our students for a fulfilling professional career in their chosen industry. We are committed to upholding our values of providing excellence in training”

Declaration

- ▶ This training program is on AUTONOMOUS basis conducted by SmartBrains.
- ▶ SmartBrains has right to expel any student at any time for misbehavior, poor attendance without refunding the fees.
- ▶ Certification will be issued only after completion of course, submission of all assignments and passing all the examinations.
- ▶ SmartBrains has its own rules and regulations about conducting examinations and assessment of examinations

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