Electrical Safety Compliance Professional

Energy Milestones Corporation

Advancing Professionals to the next level

Energy Milestones is proud to be accredited, partner and associated with the following association bodies:

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Electrical Safety Compliance Professional

Course Objectives

At the end of this course, participants will be able to:

- Explain the issues (statistics) associated with poor electrical safety in the workplace.
- Define and differentiate between qualified and unqualified persons under OSHA
- Identify requirements specified in OSHA, NFPA 70E, and describe
- seminars and differences in OSHA & 70E.
- Fundamental requirements for high voltage electric safety.
- List types of electrical hazards to personnel and describe the nature of the hazards
- Electric shock in high-voltage equipment.
- Grounding system with high-voltage equipment.
- High-voltage protective equipment is in a safe and reliable condition.
- Neutral grounding in high-voltage equipment is protective.
- Earth resistivity measurements for high voltage.
- Overvoltages on the power system and safety.
- High voltage Cables and safety. Alternative forms of power switchgear and circuit breakers – current-limiting, non-current-limiting, etc.
- Power optimisation equipment for real power and use of transformers, transmission lines, generators and motor devices to improve system operation
- Electrical hazards and precautions, Statutory regulations and codes of practice, High voltage safety rules, Electrical safety documents, Operational features of switchgear.
- Circuit breakers - oil, gas, air and vacuum
- Auxiliary equipment
- Primary conductors and switchgear enclosures
- Switchgear maintenance
- Describe tests that can be done on switchgear
- Battery supply units, Introduction to electrical faults and protection
- Fault diagnosis.

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Course Content

1. Fundamental requirements for high-voltage electric safety
   - Overview of a typical system covering generation, transmission and distribution
   - Determination of the flow of real (P) and reactive power (Q)
   - Determination and control of fault level
   - Introduction, switchgear definition, main function components& specifications
   - Main high voltage equipment
   - Generation of high voltage
   - Earthling switch
   - Operation of high voltage equipment (circuit breaker, motors, transmission lines, etc.)
   - High-voltage electric safety

2. Electric Shock in high-voltage equipment
   - Electric Shock in high voltage
   - Shock and the human body
   - How electricity hurts people
   - Safety precautions to be taken in high voltage during maintenance
   - Coping with rising demand for power transmission and distribution
   - The costs associated with increasing fault level
   - Power switchgear equipment design and operation
   - Arc-less Power switchgear
   - Quality of switchgear equipment.
   - Grounding system with high-voltage equipment

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3. Neutral grounding in high-voltage protective equipment
   - Ground –grid mesh electrode
   - Failures, causes, and analysis of faults in high-voltage sides.
   - A practical approach to safe grounding.
   - The requirements for neutral grounding
   - High voltage protective equipment is in a safe, reliable condition.
   - Grounding for power system plants
   - Methods for decreasing grounding resistance
   - Advantages and disadvantages of each grounding system
   - High Voltage Applications - Surge protection, current limiters, network

4. Earthing and Electrical Safety
   - Earth electrode resistance
   - Earth fault loop impedance.
   - Requirements for RCD protection,
   - Protective against mechanical damage.

5. Safety-Related Work Practices
   - Determine the LO/TO procedure applicable to a given facility, operation,
   - equipment or activity
   - Selection and use of work practices of De-energised work practices
   - Approach boundaries and approach distances
   - Requirements for the use of test instruments and equipment, or Requirements for insulated tools
   - Other equipment, such as ladders, barricades, signs

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6. HIGH VOLTAGE SWITCHGEAR.
   - Fundamentals of Switchgear and Requirements for Switchgear.
   - Air Blast Switchgear.
   - Oil-Filled Switchgear.
   - SF6 Switchgear.
   - Vacuum Switchgear
   - Test Requirements for Switchgear

7. Working On or Near Live Parts
   - List the conditions under which “hot work” is allowed.
   - Energised electrical work permit.
   - Optical Current Transducers for Protection - optical current sensors eliminate CT saturation
   - Protection against corrosion
   - High Voltage Applications - Surge protection, current limiters, network switching, etc.
   - Non-linear loads - harmonics at PCC - filtering - G5/4 requirements

8. Electric safety in high-voltage power systems
   - Electric safety in high-voltage Cables
   - Electric safety, Testing and maintenance of high-voltage circuit breaker
   - Electric safety in high voltage Switchgear Preventive maintenance
   - System protection
   - Electrical Insulation - Air and SF6 - the problems
   - Condition Monitoring of Plant
   - Power optimisation equipment for real power and use of transformers, transmission lines, generators and motors
   - devices to improve system operation

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9. Personal Protective Equipment (PPE)
   - Basic types of personal protective equipment (PPE) for tasks involving electrical hazards.
   - Limitations of PPE.
   - Flame resistant (FR) clothing and layering of clothing for protection and listing clothing prohibited where electrical hazards are present.
   - Select PPE for a given Hazard Risk Category
   - Requirements for use, care, maintenance and storage of PPE.

Targeted Audience

Electrical Engineers and Experienced Electrical Maintenance technicians.

Course Methodology

Facilitated by an experienced professional trainer, this training course will be conducted as a highly interactive workshop session. A variety of training methodologies and facilitation techniques will be used before and during the course whenever applicable. These methods are aimed at enhancing individual and group interaction while maximizing learning. Some of these methods are:

- Online Pre-post Test
- Colorful Visual Aids
- Gamification
- Self-Assessment Instruments
- Simulations
- Case Studies
- Videos
- Group Exercises & Discus sions
- Role plays
- Indoor & Outdoor games