ELECTRICAL SAFETY

Electrical Safety, Operation and Maintenance for Medium Voltage (MV) Distribution Systems and Equipment

NTT Training
A DIVISION OF ECPI UNIVERSITY

DURATION
2 DAYS

LIVE ONLINE TRAINING

ONSITE – IN CLASS TRAINING

Medium voltage distribution systems operate at 1,000 volts or greater and are found in industrial and campus-style facilities, municipality installations and any location where large amounts of electrical power is consumed. This course begins with an introduction to these systems and safety compliance issues. The course then proceeds through the typical medium voltage distribution system from the incoming substation through the switchgear, circuit breakers and equipment found in the facility. For each area the safety, operation and maintenance requirements are addressed. Temporary protective grounding applications are covered. Various methods of arc flash mitigation affecting medium voltage are discussed.

Clients may elect to have the training address their specific medium voltage system utilizing their drawings and procedures.

WHAT THIS COURSE COVERS

- Medium Voltage Systems and Equipment
- Protective Relaying for Medium Voltage
- Underground and Overhead Distribution
- Substations and Switchgear
- Temporary Grounding

WHO SHOULD TAKE THIS

- Facility Electricians and Supervisors with equipment 1,000 Volts or greater.
- Example organizations are: industrial facilities, manufacturing, healthcare, transportation facilities, refineries.

COURSE OUTCOMES

- Safely operate and maintain medium voltage electrical distribution systems
- Understand the functions, major components and typical tasks associated with medium voltage distribution.
- Identify the safety requirements for inspection and maintenance of medium voltage systems.

ELECTRICAL SAFETY

Electrical Safety, Operation and Maintenance for Medium Voltage (MV) Distribution Systems and Equipment

NTT Training
A DIVISION OF ECPI UNIVERSITY

COURSE AGENDA

INTRODUCTION TO MEDIUM VOLTAGE SYSTEMS AND EQUIPMENT

- Overview and applications
- Review of typical industrial MV one-line drawings
- Job tasks: Switching, Clearances, Electrical LOTO, Maintenance
- Applicable Codes and Standards
- Specific Hazards of MV and mitigation techniques
- NFPA 70E requirements
- Module Quiz: Introduction to Medium Voltage Systems and Equipment

SUBSTATIONS

- Ownership and responsibilities
- Major Components
- Safety procedures for substations
- Switching operations
- Maintenance requirements for safety
- Breakout Exercise: Navigating the MV One-Line Drawing
- Module Quiz: Substations

PROTECTIVE RELAYING

- Purpose and types
- Introduction to Time Current Characteristic (TCC) curves
- Protective relaying schemes
- Maintenance requirements for safety
- Breakout Exercise: Interpreting protective drawings and data
- Module Quiz: Protective Relaying

UNDERGROUND (UG) DISTRIBUTION

- Diagrams of UG Distribution
- Safety concerns for working underground distribution
- Confined Space Entry overview
- Maintenance requirements for safety
- Module Quiz: Underground Distribution

OVERHEAD DISTRIBUTION

- Diagrams of Overhead Distribution
- Safety concerns for working overhead distribution
- Bucket Truck Operations
- Maintenance requirements for safety
- Module Quiz: Overhead Distribution

UNIT SUBSTATIONS

- Purpose, diagrams, construction and operation
- Components
- Transformer connections
- Maintenance requirements for safety
- Module Quiz: Unit Substations

MEDIUM VOLTAGE CIRCUIT BREAKERS AND SWITCHGEAR

- Types and construction
- Safe Operation
- Switching and Key Interlock systems
- Maintenance requirements for safety
- Module Quiz: Medium Voltage Circuit Breakers and Switchgear

TEMPORARY PROTECTIVE GROUNDING FOR MEDIUM VOLTAGE SYSTEMS

- Purpose and OSHA requirements
- Inspection of grounds and tools
- Methods of applying and removing grounds
- Module Quiz: Temporary Protective Grounding for Medium Voltage Systems

ARC FLASH MITIGATION METHODS PER THE NEC®

- Requirements and application to MV systems
- Requirements for Fuses
- Requirements for Circuit Breakers
- Module 9 Quiz: Arc Flash Mitigation Methods per the NEC®

COURSE SUMMARY AND CLOSING

- Review of course content and answer questions
- List next steps for facility's medium voltage safety

ELECTRICAL SAFETY

Electrical Safety, Operation and Maintenance for Medium Voltage (MV) Distribution Systems and Equipment

NTT Training
A DIVISION OF ECPI UNIVERSITY

CLIENT TAILORING

Clients may elect to have the training address their specific medium voltage system utilizing their drawings and procedures. System installation, maintenance and safety audits of the system are additionally available.

LIVE ONLINE TRAINING EQUIPMENT

CLIENT PROVIDED COMPUTER REQUIREMENTS

- Student email address to receive access to NTT's online platform
- Internet Access through a computer (laptop or desktop)
  - 1:1 Participant minimum bandwidthrequirements: 1.2 Mbps (download)
- Ability to download and view files online
- Computer Camera
- Computer with speakers, microphone.
- Browser with recent updates

NTT PROVIDED STUDENT MATERIALS

- Access to NTT's online platforms:
  - Canvas for digital exercises
  - Zoom for web video conference
    - No purchase or install necessary but students willbe required to test the system they will be taking the class on before the day of training.
- Hard-Copy of Texts & Industry Standards, NTT Job Aids and general consumables: notepad, pens/highlighters, tabs
- Digital-copies NTT materials including Phone Apps