

Advanced Lineworker Certificate Program (AdvLC)

This certificate is designed for mid-level lineworkers with an interest in furthering their knowledge, skills and abilities. This certificate consists of five classes at three days each. The classes are typically scheduled in Bowling Green, KY and Jackson, TN.

Advanced Lineworker Certificate Training

// **Phase 1** (3 Days – 2.1 CEUs)

- Protective Grounding
- Transformer Fundamentals
- Transformer Connections

// **Phase 2** (3 Days – 2.1 CEUs)

- Substation Operating Equipment
- Switching, Procedures, & Troubleshooting
- Schematic & One-Line Diagrams

// **Phase 3** (3 Days – 2.1 CEUs)

- Advanced Transformer

// **Phase 4** (3 Days – 2.1 CEUs)

- Distribution System Overcurrent Protection
- Voltage Regulators & Settings
- Secondary Voltage Problems & Customer Service

// **Phase 5** (3 Days – 2.1 CEUs)

- Underground Components
- Cable Preparation

// Phase 1: Advanced Lineworker Certificate Training

Protective Grounding

Installing protective grounds and short-circuiting leads at the work site protects against the hazards of accidental energizing, static charges and induced voltages. Proper testing, installation and placement of protective grounds determine their effectiveness. This module teaches participants the principles of grounding, along with the reasons for grounding. It outlines the proper procedures and approved grounding equipment for installing temporary safe working grounds on de-energized circuits.

Transformer Fundamentals

A lineworker must be able to interpret information on transformer nomenclatures to assure proper and safe application of equipment and the most reliable service for the customer.

This module provides a review of electrical measurements, Ohm's Law, and series and parallel circuits, and how these apply to the operation of a transformer.

Participants also discuss the theory of distribution transformer operations.

Transformer Connections

Each problem in the field communicates a possible source of trouble. A lineworker should stop to think out the problem, consider the circumstances, and measure and analyze the voltage readings to determine the trouble source. Participants in this module gain hands-on experience using miniature training transformers in troubleshooting exercises with actual 120/240 and 277/480 voltages.

// Phase 2: Advanced Lineworker Certificate Training

Substation Operating Equipment

Substations and switchyards may seem complex and confusing to untrained personnel, but once they are reduced to the basic components – which this module does – they are much easier to understand. Most substations and switchyards contain the following components: transformers; disconnecting devices such as air break switches, circuit switchers; and disconnects.

Components may also include oil circuit breakers, vacuum circuit breakers, gas circuit breakers or air circuit breakers and monitoring devices including relays, fuses, current and potential transformers, and indicating meters. Participants learn the functions and safety requirements for working with each type of substation operating equipment.

Switching, Procedures, & Troubleshooting

The electrical substation is an installation with electrical equipment capable of interrupting or establishing electrical circuits and changing the voltage, frequency, or the other characteristics of the electrical energy flow. This module trains lineworkers in these procedures.

Upon Completion of this class you should have:

- An understanding of the major components within a substation and their functions.
- A general understanding of the electrical drawings used in the switching of equipment in a substation, and of procedures for troubleshooting problem occurrences in the substation.

Switching Schematic & One-Line Diagrams

This module enables the lineworker to identify problems that could occur within a substation on a trouble call. This session reviews transformers and circuit breaker drawing.

// Phase 3: Advanced Lineworker Certificate Training

Advanced Transformer

When servicing transformer banks in an emergency situation, understanding transformer bank sequence is essential. This module teaches three-phase connections, including troubleshooting within these connections.

Voltage phasers are key to transformer bank construction, troubleshooting and emergency transformer bank problem-solving, and lineworkers with an understanding of voltage phasers can more effectively analyze transformer bank problems.

The students will learn hands-on problem-solving techniques through study and analysis of miniature transformers.

// Phase 4: Advanced Lineworker Certificate Training

Lineworkers need to know how system protective devices operate in emergency situations, to protect equipment from damage, reduce customer outages and limit hazards to life and property. This module provides training on reclosers, regulators, and capacitors; as well as training on fuses and sectionalizers. Engineering, trouble shooting, and safety procedures and concepts are also covered in this three day class.

Distribution System Overcurrent Protection

// The Basic Objectives are to:

- Prevent or minimize damage to equipment and circuits
- Maintain and improve continuity of service to customers
- These objectives must be done at a cost consistent with the values of the service provided

// These Objectives are Achieved by Utilizing:

- Protective devices (fuses, reclosers, breakers, sectionalizers, etc.)
- Construction practices (phase spacing, conductor insulation, tree trimming, etc.)
- Planning (radial or network, automatic or manual sectionalizing taps from feeder adjacent feeders, etc.)

Voltage Regulators & Settings

Proper voltage regulation is important to both customer satisfaction and economic operation of a utility system. Voltages that are too high cause premature equipment failure; voltages that are too low result in dissatisfied customers. This module will teach lineworkers how to properly isolate a voltage regulator and familiarize them with the operating principles and settings of voltage regulators.

Secondary Voltage Problems & Customer Service

Quality service and good communication are the keys to customer satisfaction. This module explains acceptable voltage parameters for customers, and gives lineworkers information on handling customer complaints and dissatisfied customers. Participants will use simulated customer complaints and role-play to improve their customer service skills.

// Phase 5: Advanced Lineworker Certificate Training

Underground Components

Proper installation and operation of underground systems is critical to keeping them maintenance-free. With the many different types of components and accessories – and with manufacturers developing new products each day – it can be difficult for utilities to know the correct procedures for each component. This module provides a comprehensive review of underground systems, with an emphasis on proper installation and operating methods.

Cable Preparation

When working with high voltage insulated cable, not following proper procedures can result in tragedy. In this module, lineworkers learn the proper, manufacturer-recommended techniques to prepare cable for splicing and terminating.