



# Training Catalogue

2025

Questions?

Email [trainingservices@shermco.com](mailto:trainingservices@shermco.com)

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# Inside Shermco Training Services

As a NETA-certified test company, Shermco Industries has the expertise to show you how it's done the right way—the safe way. Our instructors include NETA-certified technicians, industry-leading engineers and other qualified personnel who are current in the field they are teaching. If quality of training is important to you and your work practices, go with professionals. We are here for your safety.

## Open Enrollment Classes

Training technicians and other employees are the key way to keep everyone safe and up-to-date on all technical industrial regulations and skills. Shermco is here to make sure that instructor-led and hands-on training given is not only relevant but also covers each technical aspect spanning the industry. For your convenience, we schedule classes at our training facility in Irving, Texas.

## On-Site Training

Shermco has fully developed training programs that we can bring to you. Most courses are available at your job site as well as in open-enrollment classes. Many classes can be customized to customer-specific equipment and devices. Our onsite training programs provide the most effective hands-on training experience at very cost-efficient rates. The Benefits of On-Site Training:

- ▶ We train around your schedule.
- ▶ Modified classes to address your specific needs.
- ▶ Address your company's systems and equipment.
- ▶ Personnel available on site for emergencies.
- ▶ Consistency in your personnel training.

## Computer-Based Courses

Do you have technicians who require basic skills training or refresher training? We have something that may be of interest. We provide web-based training. These are not intended to be full-fledged training courses, nor will they take the place of our hands-on courses. What these web-based programs will do is provide that “tune-up” needed once your technicians and engineers have had hands-on training, but maybe have not had the opportunity to perform it often enough to be proficient.



# Safety Compliance Solutions

OSHA standards require that employers adopt certain practices, means, methods or processes reasonably necessary to protect workers on the job. It is the responsibility of employers to become familiar with standards applicable to their establishments, to eliminate hazardous conditions to the extent possible, and to comply with the standards. Team Shermco is available to assist you in this effort.

As a field service operation, we have an advantage over most engineering and consulting firms in that not only do we provide information to our customers related to electrical safety and system operations, we actually deal with and implement those same issues within our own organization.

Additionally, members of our staff are actively involved in electrical standards, including committee membership participation in NFPA 70E (Standard for Electrical Safety in the Workplace), NFPA 70 (National Electrical Code), NFPA 70B (Recommended Practice for Electrical Equipment Maintenance), the IEEE IAS Electrical Safety Workshop, and other industry-related committees and organizations. Services available include the following:

## Site Safety Assessment/Audit

Electrical equipment presents a unique set of safety hazards that must be addressed to minimize potential injury, prevent loss of life and protect property. Unlike an audit that looks for NEC violations, the Site Safety Assessment is intended to determine whether the policies, procedures, training and work practices are adequate to meet OSHA, MSHA, and NFPA 70E requirements. Weaknesses and strengths of your existing Electrical Safety Program (ESP) and management controls are evaluated and a report is delivered that outlines what steps should be taken and helps prioritize the findings. A cross-section of workers and supervisors are interviewed to determine their understanding of regulatory requirements and safe work practices, also. This program incorporates the ESP Review, as well.

## Arc Flash Study

Arc flash hazard studies determine the hazard distance and amount of incident energy that can occur in electrical equipment. These studies are used to determine what level of protective gear workers should wear when working on or near energized electrical equipment. Arc flash studies are performed in accordance with ANSI/IEEE Standard 1584 (IEEE Guide for Performing Arc Flash Hazard Calculations) and NFPA 70E (National Fire Protection Association, Standard for Electrical Safety in the Workplace).

## Electrical Safety Program Review

SHERMCO will review your electrical safety program for conformance with existing consensus standards: OSHA and MSHA regulations. Our objective is to ensure that processes and procedures are in place such that company personnel and outside servicing workers (subcontractors, etc.) are apprised of site hazards, PPE requirements, safe work practices, and emergency/evacuation procedures. This includes evaluating your complete written Electrical Safety Program and providing a full report upon completion.

## Electrical Safety Program Development

Electrical safety is addressed by many regulatory agencies. Every site should have a comprehensive electrical safety program, including arc-flash studies and written lock-out procedures. Shermco can help you develop and implement a comprehensive program to ensure safe work practices and compliance. ESP elements include: purpose and policy; responsibilities; employee training requirements; inspections and audit standards; equipment standards; standard operating procedures for electrical work; personal protective equipment requirements; and labels and signs.

# Computer-Based Courses

**Add convenience to training programs.** Our computer-based courses are developed to supplement our hands-on instructor-led training. These online courses contain robust modules that are packed with information on the topics listed below.

## Bundle To Design The Curriculum For Specific Training Requirements

AC Motor Theory

Medium-Voltage Cable Testing & Diagnostics (three-part series)

AC Motor Types

Motor Starting Methods

AC Reactive Elements: Power Factor Correction

Protective Relays

Arc Flash Mitigation Techniques

Sf6 Switch Operation & Maintenance

Battery Maintenance & Testing

System Grounding Methods

Cable Splicing & Termination

Transformer: Power Factor & Tip Up Testing (two-part series)

Circuit Breaker Maintenance & Testing

Transformer Testing: Oil Tests

Construction & Failure Mechanisms

Transformer Testing: Dissolved Gas Analysis

DC Motors

Transformer Testing: Sweep Frequency Response Analysis

Electric Motors

Transformer Testing: Turns Ratio Testing

Electrical Power Distribution Systems

Transformer Testing: Winding Resistance Measurements

Electrical Safety Refresher

Transformers: Demagnetization of Power

Fundamentals of Electricity (seven-part series)

Transformer Cores

Grounding & Bonding

Transformers: Excitation Current Test (two-part series)

Introduction to Circuit Breakers

Understanding Time Current Curves

Low & Medium-Voltage Switches

Working Principles of a Transformer

Medium-Voltage Cable Construction

# Courses

## 2025



# Electrical Safety for Qualified Electrical Workers

<b>TUITION:</b>	\$850*
<b>DURATION:</b>	2 Days
<b>CEU:</b>	1.6 Units
<b>PREREQUISITES:</b>	It is recommended, but not mandatory that attendees should have some basic electrical training and field experience.

## COURSE DESCRIPTION:

Designed for all maintenance and testing personnel who work on or near electrical equipment. This seminar meets and exceeds the basic OSHA-mandated electrical safety training. All of the concepts of electrical safety are carefully explained in both classroom and hands-on sessions. These assure that the skills and knowledge can be demonstrated to meet the OSHA requirements. The basic class and lab is primarily focused on applications below 600 volts, but an optional one day lab session is available for understanding and demonstrating the special skills and knowledge required for medium voltage applications.

*\*Tuition price is for open enrollments, does not include costs for on-site bookings.*

## COURSE LEARNING OBJECTIVES:

- ▶ Recognize, understand and avoid electrical hazards and risks (shock, arc flash, and arc blast)
- ▶ How to develop and implement a JSA/JHA to address hazards and plan the required steps needed to work safely on or near energized conductors and circuit components.
- ▶ Safe work practices for work on or near metal clad switchgear, substations, motor control centers, medium-voltage motor starters and facility electrical systems.
- ▶ How to place equipment in an electrically safe work condition and properly utilize lockout/tagout (LOTO) requirements.
- ▶ Proper selection, maintenance, testing, use, and storage of PPE. Learn their purposes and limitations.
- ▶ How to inspect insulated tools and understand their limitations of use
- ▶ How to select and apply temporary grounds as well as specific equipment grounding hazards including step and touch potentials.
- ▶ How to use a transformer short circuit current/incident energy calculator and how to estimate incident energy under field work conditions.
- ▶ How to perform absence-of-voltage testing to help ensure an electrically safe work condition.
- ▶ Review OSHA Electrical Safety Related Work Practice regulations (29CFR 1910.311-.335 as well as Articles 110, 12 and 130.
- ▶ Understand the current utilization of NFPA 70E and the annex tables. Seminar-based program with round-table discussions.

## CONTACT US TO BOOK YOUR NEXT SESSION!

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## LAB SESSION:

# Electrical Safety for Qualified Electrical Workers

<b>TUITION:</b>	\$575*
<b>DURATION:</b>	1 Day
<b>CEU:</b>	0.8 Units
<b>PREREQUISITES:</b>	Electrical Safety for Qualified Electrical Workers

## COURSE DESCRIPTION:

Technicians and supervisors are often hesitant to perform tasks on medium-voltage equipment without some prior training or experience. This one-day lab session pulls all the pieces together for planning and executing specific tasks on medium-voltage energized equipment. A planning session is followed by hands-on practice in Shermco's training substation under the supervision of our field-experienced instructors.

*\*Tuition price is for open enrollments, does not include costs for on-site bookings.*

## COURSE LEARNING OBJECTIVES:

- ▶ Focusing on medium-voltage applications.
- ▶ How to assemble all the components of an electrical safety program into a practical job plan.
- ▶ Hazard identification and risk assessment.
- ▶ Absence of voltage testing of medium-voltage switchgear.
- ▶ Grounding of medium-voltage switchgear.
- ▶ Changing medium-voltage air-switch fuses.
- ▶ Inserting and removing (racking) medium-voltage circuit breakers.
- ▶ Inspection of PPE and arc-rated clothing.



# Electrical Safety for Non-Electrical Personnel

<b>TUITION:</b>	\$550*
<b>DURATION:</b>	1 Day
<b>CEU:</b>	0.8 Units
<b>PREREQUISITES:</b>	None

## COURSE DESCRIPTION:

Virtually every worker on an industrial or commercial job site works with or uses electrically powered equipment. Most of these workers have no concept of the hazards they could possibly be exposed to by performing common, everyday tasks. Jewelry contacting energized components, overstressed power strips, coffee pots, and heaters placed into the workplace all can increase the risk to the employee and to production if the worker is not aware of the potential issues involved. This course covers common situations that could place the non-electrical worker into dangerous situations. This course is primarily designed to meet the training requirements in NFPA 70E Section 110.2(A)(1)(C)(2).

*\*Tuition price is for open enrollments, does not include costs for on-site bookings.*

## COURSE LEARNING OBJECTIVES:

- ▶ Review of electrical hazards, their causes and the potential for injuries and fatalities.
- ▶ Understand how to avoid these hazards.
- ▶ Common situations that can increase risk to workers.
- ▶ OSHA's electrical safety-related work practices regulation as it applies to non-electrical personnel.
- ▶ Understand electrical LOTO and the Safe Work Zone.
- ▶ Understand applicable OSHA regulations for non-electrical workers.
- ▶ Understand and apply NFPA 70E requirements for unqualified persons.
- ▶ Understand the safe approach distances for shock, arc flash, arc-blast and the purpose of a safe work zone.

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# Electrical Safety Refresher

<b>TUITION:</b>	\$550*
<b>DURATION:</b>	1 Day
<b>CEU:</b>	0.8 Units
<b>PREREQUISITES:</b>	Attendees should have completed OSHA-mandated electrical safety training (Electrical Safety for Qualified Electrical Workers class or equivalent).

## COURSE DESCRIPTION:

This one-day class is designed for those who have previously met the OSHA mandated training requirements of NFPA 70E and need to be re-certified. It is a concise review of the concepts and practices required for safe electrical work. This course is designed to meet the training requirements in NFPA 70E Section 110.2(D)(3).

*\*Tuition price is for open enrollments, does not include costs for on-site bookings.*

## COURSE LEARNING OBJECTIVES:

- ▶ Electrical hazards and safety procedures for work on metal-clad switchgear, substations, motor control centers and facility electrical systems.
- ▶ Proper selection, maintenance and use of required PPE.
- ▶ Energized and de-energized work policy and LOTO requirements.
- ▶ Safe use of portable electrical equipment, including inspection and testing.
- ▶ Review of OSHA Electrical Safety-Related Work Practice regulations (29CFR1910.331-.335) as well as Articles 110, 120 and 130 of the NFPA 70E.

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# Electrical Safety for Managers

<b>TUITION:</b>	\$550*
<b>DURATION:</b>	1 Day
<b>CEU:</b>	0.8 Units
<b>PREREQUISITES:</b>	None

## COURSE DESCRIPTION:

As is often the case, supervisors, managers, and engineers who are responsible for plant maintenance are not actually the individuals performing hands-on maintenance operations. However, it is critical that they understand workplace safety policies and regulations so they can plan for the direction and training requirements of maintenance staff and assure that proper PPE, LOTO, and other safety procedures are well understood and followed.

*\*Tuition price is for open enrollments, does not include costs for on-site bookings.*

## COURSE LEARNING OBJECTIVES:

- ▶ How electrical hazards in the can affect your personnel, your company and those responsible for electrical workers.
- ▶ Recognize electrical safety hazards and plan a course of action to address each one.
- ▶ OSHA regulations and NFPA 70E requirements for taking specific measures to prevent electrical hazards from causing injury or death.
- ▶ Electrical hazard awareness and recognition.
- ▶ Managing liability created by electrical hazards.
- ▶ Designing and implementing an Electrical Safety Program (ESP) including policies, safe work procedures and permits, hazard analysis, risk assessments and reduction, training, PPE and other written program documents.
- ▶ Performing an electrical hazard/risk analysis.
- ▶ Using the NFPA 70E to interpret hazard/risk category classification (HRC) of a given task and assure adequate PPE.
- ▶ How to incorporate changes implemented by the NFPA 70E update.
- ▶ Identify the steps needed to protect employees who work on or near energized parts.

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# Electrical Safety for Renewable Energy Sites

<b>TUITION:</b>	\$850*
<b>DURATION:</b>	2 Days
<b>CEU:</b>	1.6 Units
<b>PREREQUISITES:</b>	Attendees should have basic electrical knowledge. Field experience with generation, transmission, and distribution systems operating above 600 volts is desired but not required.

## COURSE DESCRIPTION:

A practical and intensive training program designed to enhance attendees' safety while working on or near a collector system and substation equipment. Safety training requirements and safe work practices for electrical workers are covered using the NFPA 70E, NESC, and Fed OSHA regulations including 29CFR1910.331.335 and selected parts of 29CFR1910.269. PPE covered in this class includes hard hats, safety glasses, arc rated vs. FR clothing, arc rated flash suits, insulated hand tools, live line tools, rubber insulating gloves, and rubber insulating blankets. Classroom lectures will be supplemented with tests and exercises intended to reinforce best practices for operations and safety.

*\*Tuition price is for open enrollments, does not include costs for on-site bookings.*

## COURSE LEARNING OBJECTIVES:

- ▶ Equipment overview and electrical safety basics.
- ▶ Hazards of electricity.
- ▶ PPE and inspecting PPE.
- ▶ Medium-voltage detection exercise pad-mounted transformer isolation.
- ▶ Exercise substation switching exercise.
- ▶ Arc flash and shock boundaries.
- ▶ Safeguards for personnel protection and job hazard/safety analysis.
- ▶ Placing equipment in an electrically-safe work condition.
- ▶ Hazards of de-energized equipment.
- ▶ Testing for the absence of voltages.

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# Basic Electrical Fundamentals

<b>TUITION:</b>	\$995*
<b>DURATION:</b>	2 Days
<b>CEU:</b>	1.6 Units
<b>PREREQUISITES:</b>	None.

## COURSE DESCRIPTION:

Whether you are new to the industry or are taking on additional responsibilities for electrical maintenance, a solid knowledge of the basics is essential to understanding the operations, maintenance and safety of any facility or factory site. This is a hands-on practical introduction to those concepts and skills that serves as a prerequisite to further training and career enhancements for both technicians and managers.

*\*Tuition price is for open enrollments, does not include costs for on-site bookings.*

## COURSE LEARNING OBJECTIVES:

- ▶ Fundamentals of matter, energy, and electricity.
- ▶ Direct current (DC) fundamentals, including Ohm's Law and calculating voltage, current, resistance and power in the DC systems.
- ▶ Battery theory and operation.
- ▶ Alternating current (AC) fundamentals, including application of Ohm's and Kirchoff's Laws to single- and three-phase circuits.
- ▶ How AC is generated.
- ▶ Inductance, capacitance, and reactance.
- ▶ How transformers work.

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# Basic Electrical Technical Skills

<b>TUITION:</b>	\$1,025*
<b>DURATION:</b>	3 Days
<b>CEU:</b>	2.4 Units
<b>PREREQUISITES:</b>	Attendees must have a solid understanding of basic electricity acquired through classroom/OJT or completion of Shermco's Basic Electrical Fundamentals training program.

## COURSE DESCRIPTION:

A 3-day companion course to Basic Electrical Fundamentals, this course features a detailed, hands-on training regimen on the use of electrical testing equipment, electrical system troubleshooting, and interpretation of electrical drawings. These are the basic skills required by any technician to safely and efficiently maintain and operate electrical equipment.

*\*Tuition price is for open enrollments, does not include costs for on-site bookings.*

## COURSE LEARNING OBJECTIVES:

- ▶ How to use Digital Volt Ohm Meters (DVOMs) to safely test a variety of components.
- ▶ Interpret nameplates and data-plates of common electrical devices.
- ▶ Proper method for operating switches and circuit breakers.
- ▶ Explanation and use of overcurrent protective devices, molded case circuit breakers and low voltage power circuit breakers.
- ▶ Effectively troubleshoot electrical control and power circuits.
- ▶ The basic understanding of electrical drawings and prints.
- ▶ Safe work practices for voltage testing, megohmmeters and micro-ohmmeters.

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# Troubleshooting & Electrical Print Reading

<b>TUITION:</b>	\$850*
<b>DURATION:</b>	2 Days
<b>CEU:</b>	1.6 Units
<b>PREREQUISITES:</b>	Attendees should have basic electrical training. Some field experience is recommended, but not mandatory.

## COURSE DESCRIPTION:

This fundamental course was developed for technicians and managers who need to understand electrical power systems: how they are designed, what can go wrong, and how to find the problem areas. Several types of drawings and schematics are explained, and hands-on exercises will demonstrate their practical use for basic troubleshooting.

*\*Tuition price is for open enrollments, does not include costs for on-site bookings.*

## COURSE LEARNING OBJECTIVES:

- ▶ Types of electrical system drawings, the basic layout and the purpose of each.
- ▶ Legends used on electrical drawings.
- ▶ Understanding and identify typical electrical symbols.
- ▶ Standard ANSI/IEEE device numbers.
- ▶ How circuits and devices interact with each other.
- ▶ To understand the “logic” functions in electromechanical control systems.
- ▶ To troubleshoot electrical problems using elementary diagrams, one-line diagrams, and Schematics.
- ▶ To understand device functions and system operations such as circuit breaker and motor controls and transfer schemes.
- ▶ Hands-on (~30%) training program augmented with round-table discussions, and perform practical exercises using elementary diagrams, one-line diagrams and schematics.

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# 2023 National Electrical Code

<b>TUITION:</b>	\$1,420*
<b>DURATION:</b>	4 Days
<b>CEU:</b>	2.4 Units
<b>PREREQUISITES:</b>	An understanding of basic electrical theory and practical field knowledge of electrical installations. This is not a basic or beginner's NEC course.

## COURSE DESCRIPTION:

This course is designed to give new or experienced users of the National Electrical Code (NFPA 70) practical experience in applying the rules in commercial and industrial applications. Through practical exercises, classroom instruction, and discussions, students will learn how to size conductors, motors, overcurrent protection and raceways for safe installations. Students will use Chapters 1 through 4 of the Code book to become proficient in finding applicable sections for most applications. Chapter 9 tables are also covered so students can properly use them in everyday work situations. The practical exercises are designed to help students become familiar with the structure of the Code and how to quickly find the articles needed for common applications.

*\*Tuition price is for open enrollments, does not include costs for on-site bookings.*

## COURSE LEARNING OBJECTIVES:

- ▶ Purpose, scope, and definitions of the NEC.
- ▶ Requirements for installations wiring and protection.
- ▶ Load calculations and overcurrent protection.
- ▶ Wiring methods, conductors, and Conductors in parallel.
- ▶ Underground installations.
- ▶ Raceway and box fill calculations.
- ▶ Conductors in parallel.
- ▶ Conductor ampacity correction and adjustment.
- ▶ Bonding and grounding Article 250.
- ▶ Switchboards, switchgear, and panelboards.
- ▶ Neutral conductor terminations.
- ▶ Motors, motor circuits, and controllers.

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# NFPA 70B

<b>TUITION:</b>	\$830*
<b>DURATION:</b>	2 Days
<b>CEU:</b>	1.6 Units
<b>PREREQUISITES:</b>	An understanding of basic electrical theory and practical field knowledge of electrical installations. This is not a basic or beginner's NEC course.

## COURSE DESCRIPTION:

The NFPA 70B standard details comprehensive standards for electrical maintenance, with an emphasis on the following five areas:

**Electrical equipment:** standards for maintaining all types of electrical equipment, including transformers, circuit breakers, and switchgear.

**Safety:** guidance on identifying and mitigating electrical hazards.

**Training:** the importance of training personnel responsible for maintenance tasks and emphasizing the need for ongoing education and certification.

**Maintenance procedures:** standards for conducting regular maintenance, such as visual inspections, cleaning, lubrication, and testing.

**Maintenance documentation:** standards requiring detailed records of all maintenance activities, including test results, repairs, and replacements to ensure compliance and facilitate continuous improvement.

*\*Tuition price is for open enrollments, does not include costs for on-site bookings.*

## COURSE LEARNING OBJECTIVES:

- ▶ Understand purpose and scope of NFPA 70B.
- ▶ Recognize specific impacts of language used in standard.
- ▶ Identify association to NFPA 70E.
- ▶ Understanding the conditions needing to be met.
- ▶ Identify maintenance intervals and existing conditions.
- ▶ Strategy for maintenance programs.

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# Industrial Plant Electrical Maintenance

<b>TUITION:</b>	\$1,420*
<b>DURATION:</b>	4 Days (32 hours)
<b>CEU:</b>	3.2 Units
<b>PREREQUISITES:</b>	Students should have basic electrical training. Some field experience is recommended but not mandatory.

## COURSE DESCRIPTION:

This course covers what maintenance personnel and managers should know about electrical maintenance and how it affects plant reliability. The maintenance and testing required for common plant devices, including transformers, protective relays, circuit breakers, cubicle maintenance, motors and motor controls is covered in detail. Based on the NFPA 70E or B and ANSI/NETA Maintenance Testing Specifications, this intensive training program provides the latest information on maintaining and testing electrical power system equipment, including what to do, when to do it and interpreting test results.

*\*Tuition price is for open enrollments, does not include costs for on-site bookings.*

## COURSE LEARNING OBJECTIVES:

- ▶ Low- and medium-voltage circuit breakers.
- ▶ Motor maintenance
- ▶ Switches and disconnects.
- ▶ Transformer maintenance and testing.
- ▶ How to interpret results and trend analysis.
- ▶ How to improve plant reliability through common-sense approaches to operation and maintenance.
- ▶ How to lower operation and maintenance cost.
- ▶ How maintenance planning can reduce unscheduled downtime.
- ▶ Hands-on (~40%) training program augmented with round-table discussions.

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# Substation Maintenance I: Breakers, Batteries and Grounding

<b>TUITION:</b>	\$1,760*
<b>DURATION:</b>	4.0 Days (32 hours)
<b>CEU:</b>	3.2 Units
<b>PREREQUISITES:</b>	Students should have basic electrical training, some field experience and basic knowledge of switchgear.

## COURSE DESCRIPTION:

This class provides the information and hands-on training to test and maintain most of the major components of the substation except for the main transformer and protective relays. It includes Hands-on (~40%) training augmented with round-table discussions.

*\*Tuition price is for open enrollments, does not include costs for on-site bookings.*

## COURSE LEARNING OBJECTIVES:

- ▶ Theory, construction and operation of common types of medium voltage metal-enclosed switchgear and circuit breakers, including air-magnetic and vacuum.
- ▶ Interpret ratings and nameplate data to identify breaker ratings and limitations.
- ▶ Understand how med-voltage circuit breakers operate and know the causes of failure.
- ▶ Safety requirements when operating, racking, testing or maintaining breakers.
- ▶ Required testing and maintenance of medium-voltage metal-enclosed circuit breakers,
- ▶ and switchgear in accordance with ANSI/NETA MTS.
- ▶ Tests commonly performed on circuit breakers and their associated switchgear.
- ▶ Maintain station batteries in accordance with ANSI/NETA MTS.
- ▶ Ground testing theory and interpreting test results in accordance with ANSI/ NETA MTS.
- ▶ How to download and distribute Schweitzer (SEL) relay event files.

## Hands-on Lab Session:

- ▶ Racking circuit breakers.
- ▶ Perform and evaluate common circuit breaker electrical tests including insulation resistance, DC overpotential, contact resistance, insulation power factor and timing utilizing equipment from a variety of manufacturers.
- ▶ Perform routine maintenance on medium-voltage air and vacuum circuit breakers.
- ▶ Perform clamp-on ground test and interpret the results.
- ▶ Test and evaluate battery systems.
- ▶ Perform fall-of-potential ground test and interpret results.

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# Substation Maintenance II: Transformers and Relays

<b>TUITION:</b>	\$1,760*
<b>DURATION:</b>	4.0 Days (32 hours)
<b>CEU:</b>	3.2 Units
<b>PREREQUISITES:</b>	Students should have basic electrical training, some field experience and basic knowledge of switchgear.

## COURSE DESCRIPTION:

This course is designed to introduce the design and operation of these large three-phase transformers including how to test and maintain them for maximum reliability. It will also include how to test a selection of substation protective relays, how to interpret the results of those tests and how to properly maintain the relay components.

*\*Tuition price is for open enrollments, does not include costs for on-site bookings.*

## COURSE LEARNING OBJECTIVES:

- ▶ Theory, construction, and operation of three-phase power transformers.
- ▶ How to interpret ratings and nameplate data.
- ▶ Required testing and maintenance of dry-type and liquid insulated power transformers in accordance with ANSI/NETA MTS.
- ▶ How to perform electrical testing of power transformers and interpret test results.
- ▶ Theory and operation of protective relays, including overcurrent, over/undervoltage, and differential.
- ▶ What tests and maintenance are typically performed on the protective relays in accordance with ANSI/NETA MTS.
- ▶ How to interpret the test results.
- ▶ How to download and distribute Schweitzer (SEL) relay event files.
- ▶ Hands-on (~40%) training augmented with round-table discussions.

## CONTACT US TO BOOK YOUR NEXT SESSION!

Get personalized support and guidance for your team at your plant or ours! Contact [TrainingServices@Shermco.com](mailto:TrainingServices@Shermco.com) and we'll work with you to find a plan that suits your needs.

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