



# MPUA

Missouri Public Utility Alliance

Missouri Association of Municipal Utilities  
Missouri Joint Municipal Electric Utility Commission  
Municipal Gas Commission of Missouri

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## Safety Training DVD Library



Over 100 water, wastewater, and electric safety training DVDs. There are a wide range of topics available including bucket trucks, fire safety, distribution, transformers, underground distribution, water supply operations and water treatment. These DVDs are a valuable resource for your municipal utility because if it's raining, you can be training!

For more information call Cathy Susa at 573-445-3279 or by email at [csusa@mpua.org](mailto:csusa@mpua.org)

**ADR: Advanced Rigging**

Linemen often work on jobs that involve rigging loads to be lifted, moved, or stabilized. An important part of a safe and effective approach to rigging is a good understanding of the factors involved. This DVD covers some of the factors that should be considered when rigging is part of the job, including rigging forces and tensions, safety factor, and weight and tension calculations. 39 minutes

**ACS-SKL: Automatic Conductor Splices**

Shows step-by-step procedures for installing an automatic splice on an overhead conductor. Includes informative close-up shots, slow-motion and cut aways to show what happens inside when a splice is made. Also covers what NOT to do when installing these permanent splices. 9 minutes

**BTS: Bucket Truck Safety**

If a bucket truck is misused or a failure occurs, an accident can happen. However, certain steps can be taken to minimize the possibility of a bucket truck-related accident. These steps include inspecting equipment, planning jobs with safety in mind, and following all applicable safety procedures. If an accident does occur, crew members must know exactly what to do and how to do it. This DVD covers a number of aspects of bucket truck safety, including how to avoid accidents, how to lower the boom in an emergency, and how to carry out a bucket truck rescue. 49 minutes

**CF1: Cable Fault Location**

This DVD explains the basic principles of using capacitive discharge equipment and voltage gradient equipment to locate faults in direct-buried cable. Demonstrates the use of capacitive discharge equipment to locate a fault in primary cable, and the use of voltage gradient equipment to locate a fault in secondary cable. Shows some of the considerations involved in locating faults. 51 minutes

**CS1: Cable Splicing**

This DVD explains the principles of underground cable splicing and demonstrates how cable splices are made. It explains how to approach splicing in both primary and secondary cable. Demonstrations of splicing both types of cable are presented. Also describes how heat-shrink and cold-shrink splices are used. 54 minutes

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**CTE: Cable Terminations**

This DVD explains the principles of high-voltage cable terminations and demonstrates how such cable terminations are made. It explains the problems associated with voltage stress and the function of stress cones. Includes demonstrations of how to make several different kinds of cable terminations. Covers how to make a high-voltage termination in a substation. 54 minutes

**CAR: Capacitors and Reactors**

This DVD describes the basic principles involved in operating and maintaining capacitors and reactors. It explains the effects capacitors and reactors have on power factor and explains how and

why capacitors and reactors are used. Demonstrates how to inspect and maintain capacitors and reactors. 59 minutes

### **CTTE: Care and Testing of Tools and Equipment**

This DVD describes and demonstrates how to inspect and care for protective equipment: rubber gloves, sleeves, blankets, line hose, hoods, mechanical jumpers, bucket trucks, and hot sticks. It also defines the objectives of dielectric and acoustic emission tests and explains, in general terms, how these tests are performed. 54 minutes

### **CB1: Circuit Breakers**

This DVD explains the basic operating principles of circuit breakers found in substations and switchyards. The fundamental concepts of arc extinguishing and circuit interruption are explained, and a variety of arc extinguishing mechanisms and circuit breaker operating mechanisms are examined. Identifies and describes the operation of six common types of arc interrupting mechanisms, and four common types of operating mechanisms. 53 minutes

### **CWP: Climbing Wood Poles**

This DVD explains the use of basic climbing equipment, basic techniques of free and belted climbing, and the care and maintenance of climbing equipment. Some basic climbing situations typically encountered by new climbers on a job are described. Demonstrates the equipment used for climbing wooden poles. Explains how to determine the proper fit of equipment, how equipment is cared for and maintained, and how equipment is tested and inspected. Also shows the basic techniques of free and belted climbing and how to maneuver around a pole. 54 minutes

### **CSS-SAF: Conductor Stringing Safety**

Describes electrical and structural hazards associated with overhead line maintenance, and what to do to avoid them. Explains how to identify, care for, inspect, and use protective equipment when working near energized lines and equipment. Covers procedures for working aloft, and how to perform a fast and safe poletop rescue. 30 minutes

### **CSI: Continuous Safety Improvement**

How the process of constant improvement applies to workplace safety. Describes the 5-step process that identifies and eliminates substandard practices that are the underlying causes of accidents. Real-world examples. 19 minutes

### **CEQ: Control Equipment**

This DVD explains basic concepts of why control equipment is needed, what is being controlled, what equipment is used to provide control, and how the equipment works. Although specific types of control equipment are used as examples, the emphasis is placed on general procedures that apply to the majority of control equipment systems. 56 minutes

### **CT1: Current Transformer Testing**

This DVD describes the application, construction, accuracy class ratings, and operation of current transformers in typical installations at substations. Two methods of checking current transformer polarity are also covered. 34 minutes

**HBI: Customer Relations and High Bill Complaints**

This DVD examines common situations encountered when dealing with customer complaints (usually related to high bills). Emphasis is placed on communication techniques used during problem resolution and on common causes of a bill being higher than normal. Typical high bill complaints are used as examples and attention is focused on how to leave the customer satisfied. 31 minutes

**DMC: Demand Metering Concepts and Applications**

This DVD discusses the need for demand metering and basic demand metering concepts. Examples of power demand by various types of customers are shown. Mechanical, thermal, and solid-state types of demand registers are examined and the principles of demand registration for each type are explained. 36 minutes

**DIS: Disinfection Strategies**

New and changing technologies as well as ongoing findings into possible health effects of various disinfectants make selecting the proper disinfection treatment one of the most challenging issues facing water providers today and tomorrow. This DVD teaches basic disinfection strategies, including chlorine, chloramines, ozone, and UV; advantages and disadvantages of each; DBPs; and waterborne diseases. This DVD also introduces the Surface Water Treatment Rule. 20 minutes

**DIST: Distribution**

This DVD describes how distribution systems are laid out, and their component parts. It shows how to recognize transformers, voltage regulators, and capacitors, and explains in general terms, how each works. It introduces the process of sectionalizing, and demonstrates how protective devices protect the system from damage, and its customers from outages. 57 minutes

**DLI: Distribution Line Installation and Removal**

This DVD explains how to install a new line to replace an old line. The situation described often occurs when roads are widened, making it necessary to install a new line on new structures. Demonstrates how to install and sag the new line, parallel it with the old line, and de-energize and remove the old line. 58 minutes

**DLG: Distribution Line Repair (Gloves)**

This DVD explains the principles involved in working on energized lines using insulated gloves. Demonstrates the principles while replacing dead-end crossarms with the lines energized. (For comparison, DLH-DVD shows the same task performed using hot sticks.) Method, communication, concentration, and safety are emphasized throughout the video. Explains how to prepare for a job that will be done using gloves, perform the work safely, and return the job site to a normal condition. 58 minutes

**DLH: Distribution Line Repair (Hot Sticks)**

This DVD explains the principles involved in working on energized lines using hot sticks. The principles are illustrated by a demonstration of replacement of dead-end crossarms with the lines energized. (For comparison, DLG-DVD shows the same task performed using gloves.) Method, communication, concentration, and safety are emphasized throughout the video. How to prepare for a job that will be done using hot sticks, perform the work safely, and return the job site to a normal condition. 55 minutes

### **DLR: Distribution Line Replacement**

This DVD explains how to replace existing line conductors with new conductors. The situation described is one that often occurs when it is necessary to increase the size of the conductors in a line. It demonstrates how to install temporary crossarms, pull and sag the new conductors, parallel them with the existing conductors, and remove the old conductors. The importance of maintaining the proper clearances and the importance of maintaining the integrity of the existing line are explained. Safety is emphasized throughout the unit. 55 minutes

### **DLS: Distribution Line Safety**

One of the purposes of grounding an overhead line during maintenance work is to protect workers if the line becomes energized. This DVD shows how an isolated or de-energized overhead line can become energized, and uses Ohm's law to determine current flow in a grounded overhead line that has become energized. Also covers grounding procedures that protect workers from fault currents. 30 minutes

### **DISS: Distribution Systems**

Give new water operators fundamental knowledge about the structures, equipment, operation, and maintenance of city water distribution systems. Water Supply Operations Distribution Systems teaches viewers: Water quality issues in the distribution system, Water quality monitoring, sampling, and analysis, Why water quality degrades in the distribution system, Water pressure and fire flow requirements, Disinfectant residuals, Flushing plans and implementation, Flushing procedures, Pigs, swabs, scrapers, Chlorination and dechlorination, Causes and solutions for corrosion, and Leak detection. 25 minutes

### **ESA: Electrical Safety**

This DVD delivers an overview of safety issues that linemen and other electric utility workers face on the job. Covers safety hazards, system protective devices, switching, tagging, testing circuits for dead, and shows how each procedure prevents injuries to workers and damage to equipment. 52 minutes

### **STT-SAF: Electrical Safety & Tree Trimming**

Safety advice for arborists, linemen and others who occasionally trim trees near energized lines. Includes basic concepts of electricity distribution systems. Demonstrates the care and use of live line tools. 22 minutes

### **EGB-SAF: Equipotential Grounding and Bonding**

How equipotential bonding and grounding protects workers. Demonstrates the grounding procedures for workers on poles, in buckets, in substations, stringing conductors, locating underground faults. 27 minutes

### **FPEI: Fall Protection Equipment Inspection**

Identifies each component of a fall-protection harness and how to inspect it. Then covers each part of a lanyard and how to inspect it. How to put on a harness. 6 minutes

### **FSA-SKL: Fire Safety**

This DVD shows how to use portable fire extinguishers during early stage responses to small fires. It begins with a brief review of what "fire" is, the classes of fires, and how to respond to each class.

Common fire hazards at electric utilities are identified. Preventative measures are discussed. Response and evacuation procedures are covered. 19 minutes

### **FAC: Flushing and Cleaning**

Once finished water enters the distribution system, the water's quality may be degraded by internal corrosion or tuberculation in the pipes. Although it is safe to drink, the water may obtain unwanted taste, odor, or color, which causes customer complaints. To combat these problems, distribution pipes need to be flushed and cleaned from time to time. This video describes basic flushing and cleaning equipment and procedures. It covers planning, public notification, minimizing customer inconvenience, safety, avoiding damage and backflow, and mechanical cleaning devices, such as swabs. 16 minutes

### **HRB: Heartbeat**

This one will get your attention: A gripping interview with Wally McKay, veteran 27-year lineman, about his near-fatal accident. His compelling message: Always follow established work practices. Includes a re-enactment of the accident and reactions from co-workers. 14 minutes

### **RGT-SAF: High Voltage Rubber Glove Techniques**

How to inspect and test rubber gloves and blankets. Demonstrates safe work practices for workers in a bucket truck, rubber-gloving energized lines up to 36kV. 30 minutes

### **HVT: High Voltage Terminations**

This DVD covers basic theory and typical practices for terminating conductors in substations and switchyards. It explains the importance of minimizing voltage stress and of maintaining proper clearances in high-voltage terminations. Examples of commonly used connection hardware are shown, and their uses are explained. Examples of typical high-voltage terminations are given to illustrate the basic principles. 55 minutes

### **SHCS: How to Sharpen your Hooks and Climbing Skills**

How to check a gaff with a gaff gage, file it if needed, and test climbers. Demonstrates good techniques for climbing a pole, securing yourself at the work area and descending a pole. 15 minutes

### **HDDE: Hydraulic Derricks and Digging Equipment**

This DVD explains three popular types of hydraulic digging equipment: digger derricks, backhoes, and trenchers. The major working parts and controls and safe operating practices for each are described. Each piece of equipment is shown safely performing a job typical of those for which it is designed. Covers how to locate and identify the major working parts and controls of digger derricks, backhoes, and trenchers. Summarizes the uses for which each machine has been designed and describe each machine's safe operation in the field. 60 minutes

### **IVC: Installation Checks and Inspections**

This DVD uses common test equipment to demonstrate typical methods of verifying the correct wiring of a meter installation. Verifications are made on field installations to determine conditions such as open coils and matched phasing of potential and current. How to check for shorted current transformers and wiring. 31 minutes

**INT: Instrument Transformers**

This DVD explains what instrument transformers are and how they are typically used. Describes different methods of connecting current transformers (CTs) and voltage transformers (VTs) in single-phase and polyphase services. 32 minutes

**ITD: Intro to T&D Systems**

This DVD gives an overview of how transmission and distribution systems deliver power from power plants to customers. It describes the major components of a typical transmission and distribution system, and how electricity flows through these components on its journey from the power plant to the customer. 47 minutes

**INM: Introduction to Metering**

This DVD gives an overall view of electric metering, and an introduction to some of the main subject areas covered in detail in later units. The unit offers a brief history of electric energy measurement, including a simplified look at watt-hour meter construction and operating principles. Also presents a brief explanation of meter testing and calibration. 44 minutes

**IYC: It's Your Choice**

Shows safe ways to re-energize a transformer after its protective fuse has blown. Also shows what can happen if you do it wrong: the transformer explodes into a column of fire. After watching this, you'll forever choose a safe method. 12 minutes

**LLT: Live Line Tools**

An introduction to hot sticks and other live line tools. How to test, transport, and inspect hot sticks. For instance, it shows how to use hot sticks to move three-phase conductors and change out a crossarm. 21 minutes

**LBO-SKL: Loadbuster Operation & Maintenance**

This is a two-part DVD. First, the video shows how to use a Loadbuster to de-energize loads. Then, it explains how to disassemble, inspect, reassemble, and test a Loadbuster. Next, the video shows how to disassemble and inspect the mechanical parts inside a Loadbuster. How to reassemble the tool, and check to determine if it's ready for use in the field. 17 minutes

**MWQ: Maintaining Water Quality**

More waterborne disease outbreaks result from problems in the distribution system than from pathogen breakthroughs in the treatment plant. This DVD explains a five-step quality assurance program, and provides specific actions utilities can implement to maintain pristine water quality in the distribution system. 21 minutes

**MHB: Material Handling Bucket Trucks**

This DVD covers the operation of material handling bucket trucks, and focuses on the material handling features that distinguish this truck from other types of bucket trucks, including the winch, jib, and conductor lifting attachments. Explains and demonstrates truck positioning, lift capacity, and conductor lifting attachments that can make a material handling bucket truck even more useful in the field. Some familiarity with basic bucket trucks is assumed. 46 minutes

**MHB-TS: Materials Handling Bucket Truck Safety**

Safety considerations for workers who use bucket trucks to lift materials. How to position the truck, plan the lift, carry out the lift. Includes safety tips for operators. 23 minutes

**MM1: Math for Metering**

This DVD introduces the concepts of ratios, percents, squares, and square roots. Also includes demonstrations of how to manipulate simple algebraic equations. 31 minutes

**MIS-SAF: Meter Installation Safety**

This video describes safety precautions, visual inspections and electrical tests to perform before installing a meter in a socket. Shows how to safely work with instrument transformers. 22 minutes

**MMCW: Modern Marvels: City Water**

Public water supply systems in the United States serve about 267 million people, about 99% of the population, but most of us know little about the vast networks of aqueducts, pipes, and pumps that make this possible. Modern Marvels: City Water Systems examines how clean water gets to millions of taps in Chicago, New York City, and Los Angeles, as well as telling the colorful history of the water systems in those cities. Along the way, Modern Marvels documents the history of public water systems worldwide, from the time of the pharaohs to today. Finally, we'll get a glimpse of cutting-edge modern technologies, including a new state-of-the-art desalination plant in Tampa, Florida. 50 minutes

**MMS: Modern Marvels: Sewers**

Join Modern Marvels to explore this less-than polite topic and examine the network of underground pipes and tunnels that carry human waste (and much else) away. Sewers flows through history from ancient Rome's pristine sewage-conveying systems, through the foul, out-the-window system of Europe in the Middle Ages, and into the revolutionary sanitation engineering of the 19th and 20th centuries. Delve into the sewers of Paris, Boston, and Los Angeles to study waste management's evolution. Meet a sewer diver (and his robotic counterpart) who inspects and ensures the efficient operation of the conduits; decipher the myths about "treasures" and creatures found in the murky depths; and find out exactly where it goes, how it gets there, and how we've learned to use it to our benefit. 50 minutes

**MOU: Multimeter Operation and Use**

A multimeter is an instrument that measures electrical properties such as voltage, current, and resistance. In substations, multimeters are commonly used for testing circuits, making adjustments, and performing many kinds of troubleshooting tasks. This DVD explains how to set up, use, and read a multimeter in a variety of substation activities. 37 minutes

**OTJS: On the Job: Sampling**

Water quality samples play a critical role in public health protection. This DVD gives sampling technicians instruction on the basic procedures for collecting routine samples for water quality compliance. The program explains why sampling is important, what kind of samples utilities must collect for regulatory compliance, preparation, sampling equipment, sampling locations, avoiding contamination, and record keeping. Special procedures for taking samples for lead, copper, and organic contaminants are also included. 11 minutes

**OCME: Operator Chemistry Made Easy**

Operators will get up to speed fast with this DVD. Operators learn how to calculate volume measurements for any size and shape tank, conversions of cubic feet of water to gallons, flow rates, concentrations in grains per gallon, parts per million, and milligrams per liter, and average daily flow. 13 minutes

**OMME: Operator Math Made Easy**

Operators will get up to speed fast with this DVD. Operators learn how to calculate volume measurements for any size and shape tank, conversions of cubic feet of water to gallons, flow rates, concentrations in grains per gallon, parts per million, and milligrams per liter, and average daily flow. 20 minutes

**ODS: Overhead Distribution Systems**

This DVD describes the basic layout of overhead distribution systems. It explains how to identify circuits and equipment in the field, and introduces delta- and wye-connected distribution systems. It shows the basic layout of an overhead distribution system and identifies circuits and equipment in the field. Covers the importance of identifying whether a system is connected delta or wye, before any work is performed. 54 minutes

**OT1: Overhead Troubleshooting**

Overhead systems are exposed to many hazards that can lead to a partial or total loss of power. When a problem occurs, troubleshooters are responsible for finding out what is wrong and determining how the problem can be corrected as quickly as possible. This DVD identifies general steps for troubleshooting any type of overhead system problem, and describes how those steps can be applied in specific situations. 33 minutes

**PMTS: Pad-Mounted Transformers and Switchgear**

This DVD covers the basic principles of operation of pad-mounted transformers and switchgear, the types of equipment that are in common use, and how they are connected. It also presents the basic principles of pad-mounted transformer and switchgear inspection and troubleshooting, and shows an example of how to detect a problem with one leg of a three-phase transformer. 59 minutes

**PFG: Pole Framing and Guying**

This DVD explains several approaches to framing and guying poles. Demonstrates several approaches to framing poles: single crossarm, multiple crossarm, armless, and vertical construction. Techniques for positioning and installing guy wires are explained. Covers the installation of crossarms and insulators on utility poles. Explains the considerations involved in selecting and positioning guys and anchors. Demonstrates how to install a guy wire. 57 minutes

**PTER: Pole Top Equipment and Replacement**

This DVD explains safe procedures for the replacement of cutouts, switches, sectionalizers, and reclosers. Routine maintenance of poletop switches is also described and demonstrated. Also covers how to re-fuse a cutout. Shows how to check the contacts and general operation of an overhead switch, and replace the switch if necessary. Covers how to identify problems in sectionalizers and reclosers, and how to replace them if necessary. 56 minutes

**PTR: Pole Top Rescue**

Demonstrates four separate one-man rescues: a pole-top rescue of an unconscious worker, a pole-top rescue of a conscious worker, a rescue from a bucket using a handline, and a rescue from a bucket using a boom strap. 17 minutes

**PTTR: Pole Top Transformer Replacement**

This DVD explains the basic procedures for safely removing and installing poletop transformers. While specific types of transformers are used as examples, emphasis is on general procedures that apply to a variety of pole top transformers. Shows how to use a boom, and blocks and a truck-mounted winch, to install or remove a transformer. Includes basic techniques for connecting and disconnecting poletop transformers. Describes how to replace a transformer without interrupting customer service. 60 minutes

**PP1: Polyphase Systems**

This DVD explains what polyphase systems are, and differences between wye and delta systems. Illustrates various transformer bank connections using phasor diagrams. Shows examples of polyphase transformer banks and their external connections. 32 minutes

**PXT: Polyphase Transformer-Rated Meter Testing**

This DVD examines transformer-rated installations and discusses where and why instrument transformers are used. Instrument transformer basics are reviewed, their polyphase connections are shown, and common polyphase transformer-rated installations are examined. Installation procedures are discussed, with close attention to transformer polarity markings. How to size, select, and verify in the field, correct CTs and VTs for a given job. 36 minutes

**PWT: Power Transformers**

This DVD explains basic principles of operation of transformers found in substations and switchyards. It describes power transformers and instrument transformers (CTs and PTs), and explains how these transformers are identified. Cooling systems and sealing systems for power transformers are also identified and explained. 60 minutes

**PCFL: Primary Cable Fault Locating**

Describes the four categories of primary underground cable faults and how each occurs. Demonstrates the equipment used to locate each type of fault. 24 minutes

**REL: Relays**

This DVD explains the basic principles of protective relays, and introduces directional and non-directional relays. It begins with the basic theory of protective relays, commonly used types of relays, and a brief explanation of how these relays are used. Includes examples of applications for directional and non-directional relays. 55 minutes

**RCS: Reliable Coliform Sampling**

Improper sampling is one of the most common errors in water quality analysis. This popular DVD provides step-by-step procedures for taking water samples for coliform tests. Particular attention is paid to sampling site selection. Procedures shown comply with the Total Coliform Rule and the Safe Drinking Water Act. 16 minutes

### **REST: Rescue Techniques**

Six videos on one disk. Each shows a rescue procedure: bucket truck rescue, pole top rescue, confined space rescue, tree rescue, tower rescue, and open water rescue. Each video runs 5 - 11 minutes

### **RIG-1: Rigging 1**

This DVD explains the fundamentals of overhead rigging. The topics covered include three basic elements of safe rigging, rope, knots and knot tying, use of a hand line, and use of a block and tackle. It also introduces approaches to performing basic rigging tasks. Covers how to plan a rigging job, how to inspect the equipment used on a job, how to tie basic knots commonly used in rigging, how to hang and use a hand line, and how to hang and use a block and tackle. Also explains to calculate the mechanical advantage of a block and tackle, and how to identify the basic parts of a rope. 61 minutes

### **RIG-2: Rigging 2**

Many jobs performed on transmission and distribution systems require heavy loads to be rigged so that they can be lifted, moved, and stabilized while work is being done. This 61-minute DVD identifies basic rigging equipment and discusses guidelines for rigging a job safely. It also demonstrates rigging methods using different types of rigging equipment. The following procedures are covered: rigging a transformer, rigging a running corner, changing out a crossarm, and transferring secondary lines. 61 minutes

### **SWPH: Safe Wooden Pole Handling**

How to safely load poles onto a pole trailer, transport them to the job site, install a new pole, and remove an old one. 20 minutes

### **SSM: Safety and Substation Maintenance**

Safety consideration for workers who operate or maintain substations. How to test the substation grounding system. Demonstrates how to safely shut down a power transformer and how to de-energize switchgear, circuit breakers, capacitors and batteries. 22 minutes

### **SUS: Safety and Underground Systems**

Demonstrates safe work practices that apply to underground distribution systems. Explains loop vs. radial systems. Details correct procedures for disconnecting a submersible transformer from an energized circuit. Shows how to use switchgear to isolate a damaged cable. 26 minutes

### **SMW: Safety in Meter Work**

This DVD points out some of the major safety concerns associated with meter work, and explains how safety hazards can be minimized. The unit examines single-phase and polyphase self-contained meter installations, pointing out where high fault current may be present. Also discusses safety practices associated with working in instrument transformer cabinets, and hazards related to open current transformer secondaries. Describes safety concerns related to bypassing, replacing, and installing self-contained meters. 36 minutes

### **SOL: Safety in Overhead Line Maintenance**

This DVD describes basic safety principles and practices applicable to work on overhead lines. Covers proper attitude, preplanning, care and inspection of equipment, and creation of a safe work area. Describes electrical and structural hazards associated with overhead line maintenance, and what to

do to avoid them. Explains how to identify, care for, inspect, and use protective equipment when working near energized lines and equipment. Covers procedures for working aloft, and how to perform a fast and safe poletop rescue. 52 minutes

### **SSS: Safety in Substations and Switchyards**

This DVD covers basic safety principles and practices applicable to substation and switchyard maintenance work. It describes electrical, chemical, and personal hazards that may be encountered in substations and switchyards. A general procedure for responding to imminent dangers and accidents is also presented. 53 minutes

### **STD: Safety in T&D Maintenance**

This DVD covers basic safety considerations involved in performing maintenance work on transmission and distribution systems. Specific electrical shock hazards and how to avoid them are discussed. It describes hazards that may be encountered in overhead, underground, and substation and switchyard maintenance work. 57 minutes

### **SULM: Safety in Underground Line Maintenance**

Underground line maintenance refers to work done on underground systems installed in conduit between manholes, and on underground residential distribution (URD) systems buried directly in the ground. This DVD identifies some of the hazards found in and around underground work areas. Explains methods used to provide a safe work environment. Describes the use of personal safety equipment and identify the safety considerations involved in a typical vault emergency. 58 minutes

### **PPS: Self-Contained Polyphase Meter Testing**

This DVD demonstrates accuracy tests on a three stator self-contained polyphase meter and a two-and-a-half stator (split element) self-contained polyphase meter in the field. This demonstration includes details on bypassing the meter and connecting test equipment for both individual element and series element testing. In addition, a procedure for bringing the meter into acceptable accuracy limits is demonstrated. 34 minutes

### **SER: Service Installation**

This DVD explains how to make single-phase and three-phase service connections. It demonstrates how to make residential service connections from underground and from overhead services. Also shows how to make three-phase connections, how to install a parallel service, and how to replace a three-phase service without interrupting the customer. 60 minutes

### **SRP: Setting and Replacing Poles**

This DVD demonstrates how to set a new pole, and two methods of manual replacement of an existing pole. The most common method of setting a pole using power equipment is demonstrated first. Because power equipment may not always be available or may not be able to reach the job site, two manual methods of replacing poles are also demonstrated. Covers how to set a pole using a derrick, how to set a pole in a hole adjacent to an existing pole by rigging off the existing pole, and how to replace a pole with a new pole in the same hole. 55 minutes

### **SUB: Substation Batteries**

A battery is a primary component of a substation or switchyard DC control system. The function of the control system is to supply control power to operate critical devices such as protective relays,

alarms and status indicators, supervisory and communications equipment, and switchgear operating circuits. This DVD describes the role of the battery in the DC control system, the components of a lead-acid battery, how a battery works, battery ratings, and general battery inspection steps. 33 minutes

### **SBT: Substation Battery Testing**

Periodic battery testing helps determine when and what kind of maintenance a battery needs. Testing helps verify the physical condition of a battery, its state of charge, and its ability to operate when needed. This DVD explains the basic steps for battery voltage and resistance testing, specific gravity testing, integrity and capacity testing, and impedance testing. 35 minutes

### **SUS: Substations and Switchyards**

This DVD explains the purposes and functions of the major equipment used in substations and switchyards. Equipment used for protection, regulation, monitoring, and communication is introduced, too. The unit also covers some of the typical checks that are made during an inspection of a switchyard or substation. 52 minutes

### **SPM: System Protection and Monitoring**

This DVD explains the principles of protection and monitoring in a transmission and distribution system. It explains the role of protective devices, system grounds, and monitoring and control equipment. Techniques for installing or replacing ground rods, arresters, and fuse links are presented. It also describes how monitoring and control equipment is typically used in a transmission and distribution system. It covers how system grounds, arresters, and fuse cutouts protect transmission and distribution system components. Describes the basic function and features of a SCADA (Supervisory Control And Data Acquisition) system. 51 minutes

### **TEMP: Temporary Structures**

This DVD describes why and how temporary structures can be used to support transmission lines. Presents circumstances that could lead to a need for temporary structures. Demonstrates positioning, assembly, and guying of a temporary structure. Explains how to transfer lines to a temporary structure. 53 minutes

### **CEL-SKL: The Hazards of Cell Phone Usage**

Demonstrates why cell phone usage can be dangerous when working conditions require full attention and concentration. It shows in realistic and sometimes humorous ways, how distractions can create potentially serious dangers to workers and to others. 7 minutes

### **TRC-1: Transformer Connections 1**

This DVD explains the common types of overhead transformers and how they are connected. Covers both single-phase and three-phase connections, with emphasis on three-phase connections. Some theory, mostly practical examples. How to make single-phase transformer connections, how to make three-phase connections in wye-wye and delta-delta configurations, and how to verify that a replacement transformer is the right one. 63 minutes

### **TRC-2: Transformer Connections 2**

This DVD explains how common types of overhead transformers can be connected together. Covers both single-phase and three-phase transformers, with emphasis on three-phase connections of three single-phase transformers. Presents connection theory using phasor diagrams and

demonstrates how each of the connections is made. Covers how to make three-phase connections in the following configurations: delta-wye, wye-delta, alternative delta-delta, and alternative wye-delta. Also shows these connections using phasor diagrams. Explains how to connect transformers to form an open bank in delta-delta and wye-delta. 57 minutes

### **TRTR: Transformer Troubleshooting**

This DVD explains techniques for troubleshooting single-phase transformers and three-phase transformer banks. How to identify a faulted transformer. Demonstrates how to isolate transformers and how to test for proper no-load voltage. How to identify a faulted single-phase transformer, isolate it, and test it for proper no-load voltage. 53 minutes

### **TT-1: Tree Trimming 1**

Trees are common throughout the service areas covered by many utilities. When trees grow into, over, or near energized equipment, they can cause interruptions in electrical service, particularly during storms and strong winds. This DVD describes the basic concepts of tree trimming, plus some of the hazards and equipment associated with tree trimming work. 36 minutes

### **TT-2: Tree Trimming 2**

During an emergency, a tree crew may not be available, and it may not be possible to postpone a job. When this occurs, linemen often handle small tree trimming jobs, or work as part of a crew to clear large trees from power lines. This DVD covers the basic tasks and safety precautions associated with emergency tree trimming work. 30 minutes

### **TAS BSAF: Trenching and Shoring & Backhoe Safety**

Excavation cave-ins are preventable with proper training and common sense. The program provides all the essential safety information workers need, including the OSHA Competent Person Standard, protective equipment, soil types, sloping, shoring, shielding, and ladders. Backhoe Safety provides essential excavation safety information, including work-site preparation, traffic control, equipment safety checks, proper use while digging, Backfilling, transporting dirt, and moving pipe. Trenching:12 minutes Backhoe: 10 minutes

### **UCI: Underground Cable Installation**

This DVD explains two methods of underground cable installation: direct burying and installation in conduit. It demonstrates how to install and connect a direct-buried cable. Also includes a demonstration of how to install PVC conduit underground, and pull cable into it. 56 minutes

### **URDC: Underground Conduit**

This DVD explains how to pull cable in manholes, and how oil-filled metal conduit is monitored and maintained. It describes typical cable-pulling equipment and demonstrates how it is used to pull cable in manholes. Oil-filled metal conduit is described, and the principles of corrosion monitoring are explained. An approach to repair of a leaking oil-filled metal conduit is also presented. 56 minutes

### **URDS: Underground Residential Distribution Systems**

This DVD explains how URD systems are connected, along with the basic components they contain. It covers the basic principles of installation and routine maintenance. It also demonstrates basic switching operations. Covers common types of URD systems. Lists and identifies common

components of a URD system and describe typical routine maintenance tasks. Describes switching in a loop system to isolate components without interrupting customer service. 57 minutes

### **URDT: Underground Residential Distribution Transformers**

This DVD covers the basic principles involved in detecting a transformer problem, how to disconnect, replace, and reconnect a faulted subsurface transformer. Basic troubleshooting techniques are presented using an example in which a subsurface residential transformer has caused a power outage. Techniques for energizing and de-energizing are illustrated. Explains how to use the process of elimination to determine the cause of a residential power outage and how to use this process to locate the cause of a residential power outage. Shows how to use diagrams to locate circuits, transformers, and houses, and know how to plan a logical search for the cause of an outage. 49 minutes

### **URDTR: Underground Troubleshooting**

The construction of underground residential distribution systems has increased significantly since its start in the 1960s. Today, many areas require URD systems for new housing developments. As the number of URD systems in use continues to grow, it becomes more and more important for linemen to be able to locate and identify faults quickly so that power can be restored to customers. This DVD describes methods that can be used to troubleshoot two types of problems that may affect URD systems: transformer faults and cable faults. 29 minutes

### **UNIF: Unidirectional Flushing**

Utilities across the country are using unidirectional flushing to combat problems like taste and odor, discolored water, and heterotrophic microorganisms. Unidirectional flushing uses targeted high-velocity water flow moving from source to hydrant in an outbound direction to scour your distribution system. This DVD explains concepts and techniques of unidirectional flushing; how to develop a flushing plan using paper maps; how computer-aided mapping simplifies the project; benefits versus traditional flushing techniques; and the benefits to consumers and the community. It includes a case study that looks at Virginia Beach's program following a change of their water treatment provider's primary disinfectant to chloramines. 21 minutes

### **UETT: Using Electrical Test Equipment**

This DVD explains the purpose and operation of voltage testers, multimeters, clamp-on ammeters, and megohmmeters to measure current, voltage, and resistance. Safety precautions are emphasized throughout. Demonstrates how to perform voltage, current, and resistance measurements using the test equipment discussed. 61 minutes

### **ULTE: Using Line Test Equipment**

This DVD introduces line test equipment used in the field to detect voltage, current, and resistance. Shows how this equipment is used, and typical readings that can be expected. Explains how to determine which instrument to use, and demonstrates how to use each meter to take a reading. 46 minutes

### **USTL: Using Tools**

This DVD explains the safe use of hand tools and power tools commonly used in line work. Basic principles and safety precautions are emphasized. The use of hot sticks is introduced, with a shotgun stick and a telescoping switch stick as examples. Describes and demonstrates how to safely use hand tools, electric tools, tree trimming tools, and percussion tools. 58 minutes

**VREG: Voltage Regulators**

This DVD explains the basic theory, operation, and maintenance of voltage regulators. Describes why voltage regulators are needed, how they work, and how they are controlled and adjusted. It also covers how voltage regulators are tested and how they are replaced, when necessary. Covers how to detect improper operation, if that occurs. Describes testing and replacement of voltage regulators when they cannot be repaired in place. 57 minutes

**WLC: Water Loss Control**

Lost water is lost money and that fact makes leak detection and repair an essential concern for all water systems. You will find everything you need to implement an active leak-detection and repair program with this DVD. With practical advice and easy-to-follow procedures, the DVD covers deteriorating materials, weak joints, earth movement, and earth settlement. 16 minutes

**WDP: Working on Distribution Poles**

This DVD explains the basic principles involved in working safely on distribution. It gives examples of how to accomplish the following jobs: replace secondary conductors, use a temporary crossarm, move energized conductors, and install dead-ends. 51 minutes

**WOS: Workplace Organization and Safety**

How good housekeeping makes for a safer, more efficient workplace. Shows examples for storerooms, garages, shops, yards, substations, vehicles, job sites. 27 minutes