

# Comprehensive LTC Maintenance Training

On-Load Tap Changer Classes at Waukesha® Training Centers, Regional Location or Your Site



Leading electricity providers know it takes more than field technicians and a dispatch center to properly maintain critical power system assets that make up their transmission and distribution systems. To be effective, your team needs to acquire knowledge and product specific skills to allow them to accurately troubleshoot and repair this equipment.

Recognizing the demand in the electric power industry for a structured program that teaches these critical skills, we developed a comprehensive series of maintenance training courses.

## PROGRAM OFFERING

We offer a series of Load Tap Changer (LTC) maintenance courses to teach the unwritten knowledge and skills that can only be obtained through years of hands-on experience. Our comprehensive training programs run full circle—from operational concepts and recommended maintenance practices to model-specific assembly techniques and OEM design changes. Course offerings target critical skill sets needed for substation engineers, field crews and apprentices to be effective:

- Theory of LTC Operation and LTC Designs
- Common Failure Modes
- LTC Inspection Preparations
- Parts Identification
- Internal Parts Inspection, Removal and Installation
- Contact Wear Patterns
- Identification of Improper Operation
- Unit Timing and Calibration
- OEM Design Changes
- Vacuum Bottle Monitoring Circuits

## LTC COURSES OFFERED

- GE LRT-200 Series
- GE LRT-65/83
- FPE TC-525, TC-546
- Siemens-Allis TLH-20/21
- Reinhausen Type RMV-II
- Westinghouse UTT, UTT-A, UTT-B
- Waukesha® UZD®
- McGraw 550 Series
- GE LRT-68/72
- GE LRT-38/48
- Siemens-Allis TLS/TLF
- ABB UZ-Type

*Additional information is available that outlines what each class covers; contact us for these detailed brochures on specific LTCs.*

## COURSE STRUCTURE

Training courses are either two or three days in length and can be held at one of our training centers, off-site at regional locations across the U.S./Canada or at a customer's site. For customer on-site training, our team coordinates shipment of required training equipment and conducts courses at the customer's facility, eliminating the need for customer travel.

Each student receives a course manual with easy-to-use field reference guides along with many pages of technical resources. Our qualified instructors teach each course. These industry experts provide many years of experience to properly train your maintenance team.

Class sizes are limited to 15 students to maximize participants' hands-on learning time and interaction with instructor(s). Contact us for customized class sizes and/or specialized training.

## FAQs

### Do you have training models?

Absolutely. We have training models on all of the LTCs for which we provide training. These models were once fully functioning in the field, were totally refurbished and are available for classes throughout the U.S. and Canada.

### Do you provide training manuals?

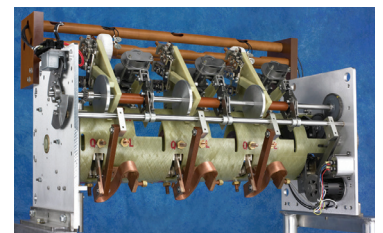
Yes, we provide training manuals that are yours to keep. Our staff has compiled the information from personal experience as well as utility-recognized experts on specific makes and models.

## CONTINUED DEVELOPMENT

Waukesha continuously develops course offerings to serve the industry. We also work closely with customers to develop specialized training courses to complement their internal development requirements, including annual recertification programs.

## TRAINING CALENDAR

Contact Waukesha® Training at 800-338-5526 for scheduled courses throughout the U.S./Canada and available dates for training classes at your facility.



GE LRT200-2 Training Unit

# Specially Designed Training Classes Provide Technicians with the Knowledge NEEDED to Maintain and Increase Reliability of LTCs!

Experience dictates that load tap changer parts and components are NOT cheap; their cost is a necessary one, however, to properly maintain system reliability. When an LTC fails, owners generally look at two things: 1) How much will it cost for the repair, and 2) How much time will it take to get the job done and put the unit back into service. One thing often overlooked, however, is HOW LONG WILL THE REPAIRS LAST.

With the information in these classes, not only can trained technicians do the work, they can do the work better so the repairs last longer. In addition to helping reduce maintenance costs for replacement parts over the life of the unit, better repairs also increase system reliability.

## MCGRAW EDISON 550 SERIES

### THINK ABOUT THIS:

- How do I know if the reversing neutral stationary contact is in adjustment
- What three things MUST be checked prior to removing an "A" frame
- What are the 13 things that need to be checked to assure the unit is in neutral
- Why do some 550 units require three hand crank revolutions per tap and some require six
- How do I properly install stationary contacts to eliminate premature contact wear



## SIEMENS-ALLIS TLH-20 & TLH-21

### WHY:

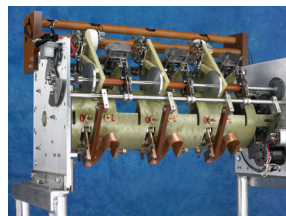
- Do you need a 1/4" diameter tool to set the angle of the reversing switch contacts
- Does the latch of the quick break mechanism need to be adjusted properly
- Do you need to know the difference between a standard and an isolated reversing switch
- Do you need to properly seat and adjust the main moveable arcing contacts
- Should the two springs of the quick break mechanism be in adjustment/operating properly



## GENERAL ELECTRIC LRT-200 & LRT200-2

### DO YOU KNOW:

- Difference between the LRT-200 and the LRT-200-2
- How and when to adjust the bypass switch
- How to time the vacuum interrupters
- How to check and adjust the sequence of operation
- How the protective system works



## WAUKESHA® UZD®

### HAVE YOU EVER:

- Wondered how the UZD operates
- Updated the reversing switch
- Tested the resistor for circuit integrity
- Tried to adjust the flywheel brake of the spring drive mechanism
- Thought about the torque values of UZD components



## FEDERAL PACIFIC TC-546 & TC-525

### DO YOU NEED TO KNOW:

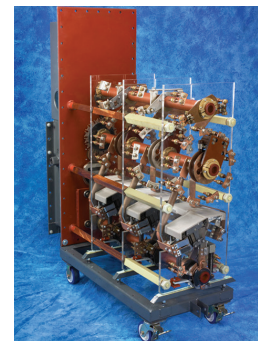
- How to time the unit properly
- What is involved in upgrading the unit and how to do the upgrade
- How to add shunts to the diverter switch and why
- What to do if the push rods are not closing the diverter switch
- How to use the "SPECIAL TOOLS" designed for proper setup



## WESTINGHOUSE UTT, UTT-A, UTT-A70, UTT-B & REINHAUSEN RMV-1

### DO YOU WANT TO LEARN:

- What to do if the arc chute is worn on one end
- What the benefits are to upgrading your UTT unit to a UTT-B
- What the advantage is of the Reinhausen RMT-I reversing switch
- Differences between UTT series units and how to identify the unit you have
- How to properly set transfer switch adjustments of the UTT Series tap changer



Not all classes are represented here; see front side for a full list of available training opportunities.

**Contact us for additional information or to schedule a class.**

**LTC Maintenance Tip**  
Performing maintenance on an LTC should always include inspection of the Geneva Gear for laminate separation.

### LOCATION

Prolec-GE Waukesha, Inc.  
9011 Governors Row  
Dallas, TX 75247  
800-338-5526

[waukeshatraining.com](http://waukeshatraining.com)