

Regulator Transformer SCADA Capacitor
Distribution Programming Testing RTU Power Relay
Insulating Oil Arrester **Electricity** Recloser
Fiber Optics Ethernet Breaker Theory **Radio**
Fuses Substation Regulator Transformer SCADA

SOUTHEASTERN

DISTRIBUTION APPARATUS

SCHOOL & CONFERENCE

Relay Insulating Oil Arrester **Electricity** Recloser
Fiber Optics Ethernet Breaker Theory **Radio**
Fuses Substation Regulator Transformer SCADA
Capacitor Distribution Programming Testing RTU

October 9th - 12th, 2006
Callaway Gardens Resort
Pine Mountain, Georgia

Capacitor Distribution Programming Testing RTU Power
Relay Insulating Oil Arrester **Electricity** Recloser
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General Information

The 2006 Southeastern Distribution Apparatus School and Conference is sponsored by **Utility Technology Association**. The conference will be held October 9th - 12th. The conference provides a forum for electric utility substation and apparatus department personnel to obtain high quality, practical, and comprehensive training and learn about new technologies and products with representatives from industry. The conference is open to anyone interested and involved in these areas.

The conference is **divided into four modules** to better provide instruction for utility professionals at all levels of experience. Both **classroom and hands on experience opportunities** are included. The courses are designed for participants to select topics they require or have an interest in.

Each participant will receive a Distribution Apparatus Conference notebook for reference materials covered during the conference. Participants in the Hand On Programming module (Module 400) are encouraged to bring their personal laptop computer.

Exhibit Hall

The Exhibit Hall will be open **Monday, October 9th through Wednesday, October 11th**. All the suppliers you need to meet will be in one place to answer your questions and demonstrate their products.

Day Participant Program

This provides an opportunity for management (general managers, purchasing agents, operation managers, engineers, etc.) to **attend one day for a reduced charge**. Come on any day and attend a few classes, then enjoy an evening of hospitality in the Exhibit Hall.

Continuing Education Hours

The Southeastern Distribution Apparatus School and Conference will award 24 continuing education hours to participants attending the entire school.

Registration Fee

Participants	\$ 235
One Day Only	\$ 90
Exhibitors	\$ 245
Additional Exhibitor	\$ 100
Presenters	No Charge

Location – Callaway Gardens Resort

Callaway Gardens is a 14,000 acres resort nestled in the southernmost foothills of the Appalachian Mountains. Founders Cason and Virginia Callaway envisioned a retreat where weary souls would come to be refreshed and inspired. They set out to build the “prettiest garden since the Garden of Eden,” and today Callaway Gardens is all that and more.

Hotel Accommodations

A block of rooms has been reserved for attendees at the **Mountain Creek® Inn at the Callaway Gardens Resort, Pine Mountain, Georgia**. Reservations can be made through the hotel by phone at 1-800-CALLAWAY (225-5292) or by fax at (706) 663-5090. **The group rate is \$99.00 + 10% tax**. Since rooms are limited, please **make your reservations by September 9th to insure availability**. Be sure to identify yourself as being with the Southeastern Distribution Apparatus School & Conference and use **reservation code 77C7V5** to get the group rate. **Accommodations include admission into the Gardens. To find out more about Callaway Gardens log onto the web site www.callawaygardens.com.**

Directions

Atlanta (70 miles) - Take Interstate 85 South to Interstate 185 South (exit 21). From Interstate 185, exit at U. S. Hwy. 27 (exit 42). Follow Hwy. 27 South to Pine Mountain. In Pine Mountain, Callaway Garden Mountain Creek Inn entrance will be on the left.

Birmingham, AL (150 miles) - Take U. S. Hwy. 280 East to Opelika and take Interstate 85 North to Ga. Hwy. 18 East (exit 2). Turn right off Hwy. 18 on Hwy. 27 Callaway Garden Mountain Creek Inn entrance will be on the left.

Montgomery, AL (110 miles) - Take Interstate 85 to Ga. Hwy. 18 East (exit 2). Turn right off Hwy. 18 on Hwy. 27 Callaway Garden Mountain Creek Inn entrance will be on the left.

Annual Dinner

Southern Bar-B-Que, with ribs and chicken, will be served on Wednesday evening. Join us for a relaxing evening of great food and good fellowship. Maps to the annual dinner will be available at registration.

Four Modules to Choose From

Module 100: Fundamentals of Distribution System Apparatus Coordinators: Freddy Morgan, Marietta Power; Todd Hubbard, Jackson EMC

This module provides instruction in basic distribution apparatus theory and application. There will be a variety of classes to learn how the equipment works, along with hands on testing of various electrical distribution apparatus. This session should be attended by those who need to gain a better understanding of the components in an electrical distribution system. This module will help the student establish a good foundation for future classes.

Module 200: Principles & Applications of Distribution System Apparatus Coordinators: Greg Seagraves, Cobb EMC; Scott Johnson, Georgia Power Company

Module providing a more in depth look of the individual distribution apparatus equipment used in the substation and on the distribution feeders. The sessions will emphasize why the equipment is used and how the equipment functions. Distribution equipment included in sessions will be regulators, breakers, transformers, capacitors, arresters, and Reclosers along with classes on the insulating mediums used.

Module 300: SCADA and Communications

Coordinators: Mary Hester, Intelligent System Solutions; Anthony Wright, Georgia Transmission Corporation

This module provides instruction on the principles of a SCADA system used for the monitoring and control of an electrical distribution system. Module will include classes on RTUs, protocols, security considerations and communication methods, such as fiber optics, Ethernet and radio. The module also includes a class on new emerging technology for system operations like Broadband over Powerline (BPL), Outage Management Systems (OMS), wireless solutions and information portals for your review.

Module 400: Hands On Programming of Recloser Controls and Relays

Coordinator: Casey Stafford, Florida Transformer, Inc.

This module provides students with instruction on the settings of recloser controls and relays. Students will learn the fundamentals of distribution feeder protection and how to apply it to the programming of relays and reclosers controls used in the substation and on the distribution feeders.

www.utilitytech.org

Southeastern Distribution Apparatus School & Conference Curriculum

Room	Module 100 109	Module 200 211	Module 300 Thyme	Module 400 Sage
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Monday

10:00 - 1:00	Registration			
1:00 - 2:00	General Session			
2:00 - 3:00	Substation Devices & Equipment Overview		SCADA Principles	
3:00 - 3:30	Networking Refreshment Break			
3:30 - 5:00	Distribution Devices & Equipment Overview		SCADA Principles Continued	Fundamentals of Distribution Feeder Protection
5:00 - 7:00	Hospitality / Exhibit Hall			

Tuesday

8:00 - 9:30	Basic Electricity Review	Substation Breakers	RTU	Relay Programming - Siemens
9:30 - 10:00	Networking Refreshment Break in Exhibit Hall			
10:00 - 11:00	Power Theory	Application of Voltage Regulators	Data Communication Methods	Relay Programming - Basler
11:00 - 12:00		Application of Capacitors	Security Considerations	
	Lunch			
1:00 - 2:00	Voltage Regulation	Transformers & Arrow System	Ethernet	Relay Programming - Schweitzer
2:00 - 3:00	Capacitor Fundamentals		Load Management	
3:00 - 3:30	Networking Refreshment Break in Exhibit Hall			
3:30 - 5:00	Overcurrent Protection Equipment	Arresters	SCADA Protocols	Relay Programming - Schweitzer
5:00 - 7:00	Hospitality / Exhibit Hall			

Southeastern Distribution Apparatus School & Conference Curriculum

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Wednesday

8:00 - 9:30	Transformer Basics	Oil Spill Clean-Up & SPCC Plans	Radio Communications	Relay Programming - Cooper
9:30 - 10:00	Networking Refreshment Break in Exhibit Hall			
10:00 - 11:00	SCADA	Insulating Oils / Mediums	Fiber Optic Communication Theory	Relay Programming - Cooper
11:00 - 12:00	Overview of Communication Technology	Dissolved Gas Analysis	Fiber Optic Communication Hands On Applications	
	Lunch			
1:00 - 2:00	Test & Measurement Equipment	Fuses	Distribution Automation	Relay Programming - General Electric
2:00 - 3:00		Reclosers		
3:00 - 3:30	Networking Refreshment Break in Exhibit Hall			
3:30 - 5:00	Test & Measurement Equipment Hands On Applications	Special Topics	Emerging Technologies	Relay Programming - General Electric
5:00 - 7:00	Annual Dinner			

Thursday

8:00 - 9:30	System Corrdination for Improved Reliability - Combined Class			
9:30 - 10:00	Networking Refreshment Break			
10:00 - 11:00	Power System Grounding - Combined Class			
11:00	Closing Session			

Module 100:

Fundamentals of Distribution System Apparatus

Basic Electricity Review

Instructor: Mike Chirico, *South Alabama Electric Coop*

AC and DC circuit theory including ohms law and associated math, circuit components, and current and voltage laws. Included are discussion of the relationship between current, voltage, resistance, impedance, power and energy.

Power Theory

Instructor: Hugo Hodge, *City of Griffin*

An expansion of the basic electricity review class – with an elaboration on volts, amps, power factor, etc. Definition and applications of KW, KVA, the power triangle, and calculating power factor.

Voltage Regulation

Instructor: Jay Gray, *Equity Utility Service Co.*

Explanation of why voltage regulators are needed and how they work. Topics include the placement of regulators, settings, and effects on the distribution system. Class will cover safety considerations of voltage regulators.

Capacitor Fundamentals

Instructor:

This class will be a discussion on why capacitors are used for power factor correction and for voltage regulation. The discussion will include applications, sizing, placement, testing, and connections of capacitors.

Overcurrent Protection Equipment

Instructor:

How an electrical distribution system is protected from current above normal operating levels. This class explains the equipment used and the overcurrent protection schemes used by the utility. How these protective devices work and where they are used. Components discussed include breakers, reclosers, fuses and relays.

Transformer Basics

Instructor: Wayne Bodie, *Florida Transformer*

Discussion in the class will include how a transformer operates, along with an overview of the different internal components of the transformer. Shows common types of transformers and how they are connected. Interpretation of the transformer nameplate data.

SCADA

Instructor: Mary Hester, *Intelligent System Solutions*

An introduction of all the components involved in a SCADA system. The types of components to be discussed are RTUs, master stations, digital and analog inputs / outputs, and IEDs.

Overview of Communication Technology

Instructor: Mark Leach, *Applied Mesh Technology*

This class will cover some of the options for communication with equipment in the substation and on the distribution lines. Students will be introduced to common communication terminology. Some of the options discussed will be serial, fiber optics, Ethernet, radio, and telephone.

Test & Measurement Equipment

Instructor: Tom Sandri, *Megger*

This class explains the purpose and operation of testing

devices for equipment such as transformers, capacitors, arrestors, vacuum bottles, batteries, reclosers, and insulating oil. There will be demonstrations of how to use the test equipment and safety precautions.

Test & Measurement Equipment Hands On Applications

Instructor: Megger; *Flint Energies*

This class will provide an opportunity to perform operation of testing devices on equipment such as transformers, capacitors, arrestors, vacuum bottles, batteries, reclosers, and insulating oil.

Module 200:

Principles & Applications of Distribution System Apparatus

Distribution Devices & Equipment Overview

Instructor: Mike Noori, *Custom Engineering Solutions*

Get an overview of key distribution equipment & devices outside the Substation fence such as: transformers, capacitor banks, regulators, fuses, lightning arrestors, reclosers, etc. This class will show how equipment works and coordinates together. It tries to explain at a high level how the distribution system works as a whole.

Substation Devices & Equipment Overview

Instructor: Tom Hix, *Georgia Power Company*

Get an overview of key substation equipment and devices such as: Station Transformer, Station Breaker, Substation Batteries, Station Service, PF Correction Banks, Reactors & Voltage Regulators. This course will focus just on the devices and equipment found within the Substation fence. It will give you a high level understanding of how a substation works.

Substation Breakers

Instructor: Larry Woody, *Georgia Power Company*

This class will include common functions, types, how breakers work and why the equipment is used. Learn about protection schemes, protective relays and how to bypass breakers. Learn about the different interruption mediums such as oil, SF6 or vacuum. Discusses testing, inspection & sampling practices. Students will learn about the components of dissolved gas analysis testing.

Application of Voltage Regulators

Instructor: Ted Johnson, *Georgia Power Company*

This class will center on how a regulator works and the internal components. Covers how they are used in distribution systems along with basic operation & functions. How they work in conjunction with line capacitors which also affect system voltage. Covers safety issues such as by-passing & deenergizing regulators. Basic inspection procedures.

Application of Capacitors

Instructor: Ted Johnson, *Georgia Power Company*

This class will be a discussion on why capacitors are used in the distribution system and how they work. Defines terms such as working power, non-working power and power factor. Also, how they work in conjunction with regulators which also affect system voltage. It will include applications, testing, inspection, safety issues and connections.

Transformers & Arrow System

Instructor: Toni Kiser, *Georgia Power Company*

Discussion in this class will include components and

internal workings of a transformer. Covers how a transformer works and how it is used on the distribution system. Learn the meaning of transformer polarity and how to easily hook up transformer banks using the Arrow System.

Arresters

Instructor: Steve Brewer, *Hubbell*

Covers how arresters work and their use in the distribution system. It introduces the student to how lightning and other causes create overvoltage on the system. We also introduce the student to the concepts of BIL (Basic Insulation Level) ratings of equipment / hardware. We discuss the importance of properly grounding the system to make arresters operate properly.

Oil Spill Clean Up & SPCC Plans

Instructor: John Mobley, *Cobb EMC*

This class will have a discussion of clean up techniques and why they are necessary. Complying with EPA regulations. SPCC plans and where they are needed.

Insulating Oils / Mediums

Instructor: Scotty Carroll, *Florida Transformer*

This class will cover the various types of insulating oils and mediums used in distribution equipment. There will be a discussion on testing and sampling practices.

Dissolved Gas Analysis

Instructor: Scotty Carroll, *Florida Transformer*

Students will learn about the benefits of dissolved gas analysis testing. They will also learn about proper sampling techniques and about methods used to interpret dissolved gas analysis.

Fuses

Instructor: Karry Brockman, *Cooper Power Systems*

Learn about the different characteristics of fuses, how they work and how they coordinate with other devices on the systems such as the station relays and reclosers.

Reclosers

Instructor: Karry Brockman, *Cooper Power Systems*

Covered in this class will be single and three phase reclosers. How they operate and how they are used on the distribution system. Helps you understand how they coordinate with other devices such as station relay and fuses. Helps you understand key differences between electronic reclosers & hydraulics and the pros & cons of both.

Special Topics

Instructors:

Panel discussion of concerns and considerations when dealing with Distribution Apparatus equipment.

System Coordination for Improved Reliability

Instructors: Joe Perry and Dane Tyler, *Patterson & Dewar Engineering*

Learn what affects the reliability of an electrical distribution system.

Power System Grounding

Instructor: Ron Purvis, *Georgia Power Company, Retired*

How does proper grounding affect the performance and safety of distribution apparatus equipment? This class includes the fundamental principles of grounding system design, purposes of grounding and bonding, and the safety assessments of grounding.

**Module 300:
SCADA and Communications**

SCADA Principles

Instructor: John McDonald, *KEMA Consulting*

This class will be a comprehensive coverage of the monitoring and control of a SCADA system. Learn how and why a SCADA system is utilized by the utility. Students will gain an understanding of the terminology, uses of data, field devices installed, and how the operator interfaces with the system.

Remote Terminal Units – RTUs

Instructor: Noel Engleman, *Georgia Transmission Corp.*

The class will discuss in depth the traditional RTU functions such as digital and analog input / output, control and monitoring, IED interfaces and functionality. There will also be discussion about programming special applications, and the RTUless substation.

Data Communication Methods

Instructor: Don Atkinson, *Thomasville Utilities*

How does the data accumulated from a SCADA system get back to the utility? This class will discuss the various methods of communication used inside the substation, also between the utility, the substation and line devices. There will be an overview of the most common communication network topologies.

Security Considerations

Instructor: Mary Hester, *Intelligent System Solutions*

Review of the NERC Standards and the best practices of the utility industry.

Ethernet

Instructors: Jason Krauskopf, *Superior Essex*

This class will be an overview of what is needed to communicate via Ethernet. There will be discussion on the comparison of Ethernet topologies, switches and routers, copper Ethernet and optical Ethernet.

Load Management

Instructor: Glenn Davis, *Entek*

Discussion of the benefits and technology available of load management systems for the electric utilities.

Traditional SCADA Protocols

Instructor: Romualdo Santamaria, *Cybertec*

An introduction to some of the most common protocols that are used in substation applications. Learn about the advantages that each of them has to offer. DNP 3.0 will be one of the protocols discussed.

Radio Communications

Instructor: Ken Brand, *Jackson EMC*

Learn about the different licensed and unlicensed radio communications used by electric utilities. Discussion on the type of equipment required in a communication building and on a tower. Recognition of antenna arrays on communication towers.

Fiber Optic Communication Theory

Instructor: Tony Parker, *OFS BrightWave*

Learn how electric utilities take advantage of the broadband capabilities of fiber optic communications to benefit electrical operation. The fundamentals of optical communications in substations will be discussed in enough detail for the student to have a basic knowledge of how thousands of voice and data signals communicate over fiber optic circuits.

Fiber Optics Communications Hands On

Instructor: Tony Parker, *OFS BrightWave*

Learn how to splice and terminate fiber optic connections. This class will provide instruction on the proper techniques and tools used while allowing the students hands on experience in splicing and terminating fiber optics.

Distribution Automation

Instructor: Dan Sias, *Southern California Edison*

Discussion of methods for automating distribution systems. The discussion includes devices, outage management, isolation and restoration, automatic switching, and capacitor bank control.

Emerging Technologies

Instructor: Freddy Daniel, *Mica-Tech*

Learn about new and emerging technology for system operations like Broadband over Powerline (BPL), Outage Management Systems (OMS), and wireless solutions.

**Module 400:
Hands on Programming of
Recloser Controls and Relays**

Fundamentals of Distribution Feeder Protection

Instructor: Craig Wester, *General Electric*

This class provides a basic understanding of the principles of relaying and protection of the electric distribution feeder. Topics included in this class are why relays are used, how relays protect the feeder, applications of various types of relays, relay coordination, analyzing an oscillography file.

Recloser Control and Relay Programming

This will be a hands on course to learn how to create and edit a program for a relay control. You can bring your own laptop. Learn from the manufacturers of the equipment. There will be discussion of how to test the various controls and relays of each manufacturer.

Relay Control Programming – Siemens

Relay Control Programming – Basler

Relay Control Programming – Schweitzer

Relay Control Programming – General Electric

Relay Control Programming – Cooper Power Systems

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About Utility Technology Association

Utility Technology Association is a non-profit organization dedicated to the delivery of high quality, practical and comprehensive training designed to meet the needs and challenges of today's electric utility industry.

Utility Technology Association's educational programs are unique because they are designed and taught by experts in the utility field. Instructors come from a wide-range of backgrounds including electric utilities, equipment manufacturers and consulting engineering firms.

Day Participant Program

An opportunity is provided for management (general managers, purchasing agents, operations managers, engineers, etc.) to attend one day for a reduced fee. Come on any day and attend a few classes, then enjoy an evening of hospitality in the Exhibit Hall. Lunch is provided for Day Participants.

Cancellations

Notification of cancellation must be submitted in writing to:

Utility Technology Association
P.O. Box 695
Clermont, Georgia 30527

Refunds, less a \$25 administrative fee, will be made for all cancellations received in writing before September 25th, 2006. No refunds will be made after that date. A substitution of attendees may be made by notifying Utility Technology Association prior to the conference.

First Name _____ Last Name _____

Badge Name (if different from above) _____

Title _____

Company _____

Address _____

City _____ State _____ Postal / Zip _____ Country _____

Phone _____ Fax _____

Email _____

Industry Category

- Utility (circle one) Investor Owned Electric Cooperative Municipal
 Consultant University / Government Organization / Association
 Vendor Other _____

Registration Fees

- _____ \$235 Participant*
_____ \$90 One Day Participant (includes lunch)
_____ N/C Presenter
_____ \$15 Extra Lunch Ticket - Tuesday
_____ \$15 Extra Lunch Ticket - Wednesday
_____ \$20 Extra Dinner Ticket - Wednesday
\$_____ Total Payment

*Participant Fee includes conference notebook, two lunches, one dinner, breaks, and admission to exhibits.

Pre-Registration Deadline is September 9th, 2006

Late and Onsite Registration are subject to an additional charge of \$20.

Register On-Line at

www.utilitytech.org

Payment

Check payable to **Utility Technology Association** enclosed for \$ _____

Please Invoice _____ Purchase Order Number _____

Credit Card Payments accepted only with On-Line Registration (VISA and MasterCard Only)

Return Registration Form To

Utility Technology Association
Suzanne Powell
P.O. Box 695
Clermont, Georgia 30527

or

Fax Registration Form To
Fax (770) 983-2722

Please email questions to info@utilitytech.org or contact **Suzanne Powell at (770) 519-1676**