



DISTRIBUTION APPARATUS
SCHOOL & CONFERENCE

September 22nd - 25th, 2008
The Hotel at Auburn University
and Dixon Conference Center
Auburn, Alabama

General Information

The 2008 Southeastern Distribution Apparatus School and Conference is sponsored by **Utility Technology Association**. The conference will be held September 22nd - 25th. 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 Module 100 classes are encouraged to bring their personal calculator.

Exhibit Hall

The Exhibit Hall will be open **Monday, September 22nd through Wednesday, September 24th**. 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.

Professional Development Hours

The Southeastern Distribution Apparatus School and Conference will award 18 professional development hours to participants attending the entire school.

Location

The **Hotel at Auburn University and Dixon Conference Center** is centrally located three miles from Interstate 85. The Hotel at Auburn University is situated in a charming university campus environment within easy walking distance to many shops and restaurants in the quaint, historical downtown **Auburn, Alabama**. Find out more about the hotel and location at www.auhcc.com.

Hotel Accommodations

A block of rooms has been reserved for attendees at the **Hotel at Auburn University**, 241 South College Street, Auburn, Alabama 36830. Reservations can be made through the hotel by phone at **(800) 228-2876**. **The Hotel reservation code is 10F6WL**.

Since rooms are limited, please make your reservations by September 1st, 2008 to insure availability. **The special room rate is \$109.00 plus tax**. Be sure to **identify yourself as being with the Southeastern Distribution Apparatus School & Conference to get the group rate**.

Directions

Atlanta to Auburn (110 miles)

Take I-85 South towards Montgomery. Take the Auburn exit (exit 51.) The Auburn University Hotel and Dixon Conference Center is located approximately 3.5 miles on US 29, directly across from Draughton Library.

Birmingham to Auburn (120 miles)

From Birmingham, take US Highway 280 East approximately 110 miles. Take a right onto Highway 147 and follow it 5 miles to Auburn. The Auburn University Hotel and Dixon Conference Center is located on the left directly across from the Draughton Library, at 241 South College Street.

Registration

The registration to the 2008 Southeastern Distribution Apparatus School & Conference can be sent by mail, fax or on-line. **Payment can be made with check, purchase order, or credit card**. Invoicing available upon request. **Credit Card payment is only accepted with on-line registration**. Exhibitor Registration Information available on school website.

www.utilitytech.org

Registration Fee

Student	\$ 295
One Day Only Student	\$ 130
Displaying Exhibitor	\$ 425
Hosting Exhibitor	\$ 275
Additional Exhibitor	\$ 130
Presenters	No Charge

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; Rickey Harris, MEAG Power Distribution Services

This module provides instruction in basic distribution apparatus theory and application. Students will learn electrical fundamentals and power theory along with how the equipment works. 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, Communications, and Emerging Technology
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 covers RTUs, protocols, security and communication methods. Includes class on new and emerging technology for system operations and discussion on how new technologies will interface with your existing systems.

Module 400: Engineering Topics
Coordinators: Casey Stafford, Emerson Process Management; Scotty Carroll, Emerson Process Management

This module provides students with in-depth instruction on a number of distribution engineering topics. Some of the topics will be Generator Principles, Lighting Fundamentals, Protective Relaying, Power Conductors, Power Calculations, Arc Flash Hazard Assessment, and Power Quality.

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Southeastern Distribution Apparatus School & Conference

Module 100	Module 200	Module 300	Module 400
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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	Generator Principles and Applications
3:00 - 3:30	Networking Refreshment Break		
3:30 - 5:00	Distribution Devices & Equipment Overview	SCADA Principles Continued	Generator Principles and Applications Continued
5:00 - 6:30	Hospitality / Exhibit Hall		

Tuesday

8:00 - 9:30	Electrical Fundamentals	Substation Breakers	Remote Terminal Units - RTUs and IEDs	Lighting Fundamentals
9:30 - 10:00	Networking Refreshment Break in Exhibit Hall			
10:00 - 11:00	Power Theory	Application of Voltage Regulators and Capacitors	Data Communication Methods	Lighting Fundamentals Continued
11:00 - 12:00			Protocols	
	Lunch			
1:00 - 1:45	Transformers and Arrow System Combined Session		SCADA Communications of the Future	Protective Relaying - A Transmission Perspective
1:45 - 2:30			Managing Non-Operational Data	
2:30 - 3:00	Networking Refreshment Break in Exhibit Hall			
3:00 - 4:30	Voltage Regulation	Overvoltage Protection	Smart Substation-SCADA Security and Field Trip	Power Conductors
4:30 - 6:30	Hospitality / Exhibit Hall			

Southeastern Distribution Apparatus School & Conference

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Wednesday	8:00 - 9:30	Capacitors	Fuses	IP Networking	Power Calculations
	9:30 - 10:00	Networking Refreshment Break in Exhibit Hall			
	10:00 - 11:00	Fundamentals of Distribution Feeder Protection	Reclosers and Coordination	Fiber Optic Communication Theory	Arc Flash Hazard Assessment
	11:00 - 12:00			Fiber Optic Communication Hands On Applications	
		Lunch			
	1:00 - 1:45	SCADA	Underground Apparatus	Distribution Automation	Power Quality Issues and Solutions for Utility Distribution Systems
	1:45 - 2:30	Overview of Communication Technology			
	2:30 - 3:00	Networking Refreshment Break in Exhibit Hall			
	3:00 - 4:30	Thermal Imaging	Insulating Oils / Mediums	Deploying a Self Healing Distribution Grid	Power Quality Issues and Solutions for Utility Distribution Systems Continued
				Video Surveillance	
5:00 - 7:00	Annual Dinner				

Thursday	8:30 - 9:30	Personal Protective Grounding- Combined Class			
	9:30 - 10:00	Networking Refreshment Break			
	10:00 - 11:00	Personal Protective Grounding Continued - Combined Class			
	11:00	Closing Session			

Classes are open to all attendees and exhibitors

www.utilitytech.org

Module 100: Fundamentals of Distribution System Apparatus

Electrical Fundamentals

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: Ed Hamby, *Kenneth E. Hamby Consulting*

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.

Transformers & Arrow System

Instructor: Tony 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. **Combined with Module 200.**

Capacitors

Instructor: Karry Brockman, *Cooper Power Systems*

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.

Voltage Regulators

Instructor: Lee Matthews and Casey Turner, *Howard Industries*

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.

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, and relay coordination.

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.

Thermal Imaging

Instructor: Mike Gibson, *Georgia Power Company*

Students will learn about the benefits of a thermal imaging program, along with a demonstration of the uses of a thermal imaging camera. There will be a look at some of the problems identified from the thermal imaging of distribution apparatus equipment.

Module 200: Principles & Applications of Distribution System Apparatus

Substation Devices & Equipment Overview

Instructor: Larry Woody, *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.

Distribution Devices & Equipment Overview

Instructor: Michael Hall, *Snapping Shoals EMC*

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 Breakers

Instructor: Tom Hix, *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 / Capacitors

Instructor: Bob Schuyler, *Beckwith Electric*

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.

Transformers & Arrow System

Instructor: Tony 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. **Combined with Module 100.**

Overvoltage Protection

Instructor: Karry Brockman, *Cooper Power Systems*

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.

Fuses

Instructor: Tim Morris, *Whitehead & Associates*

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 / Coordination

Instructor: Lee Halfacre, *Hubbell 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 relays and fuses. Helps you understand key differences between electronic reclosers and hydraulic, and the pros and cons of both.

Underground Distribution / Equipment

Instructor: Jeff Gregory, *Power Connections*

This class will cover manual switch gear, remote supervisory switch gear, Source-Transfer Models, and underground capacitor banks. Discussion of live and dead front gear. Common practices and uses and applications of underground switch gear.

Insulating Oils / Mediums

Instructor: Scotty Carroll, *Emerson Process Management*

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.

Personal Protective Grounding

Instructor: Steve Blume, *Applied Professional Training*

This class gives a comprehensive understanding of the theory and practice of safe electrical grounding principles as it relates to the individual. There will be discussion on the OSHA requirements, understanding ground potential rise, touch and

step potential, and vehicle safety along with applications, principles and procedures related to grounding. **Combined Session for all Modules.**

Module 300: SCADA, Communications, and Emerging Technology

SCADA Principles

Instructor: Steve Strauss, *Survalent Technology*
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 and IEDs

Instructor: Shawn Sabo, *QEI, Inc.*
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: Dan Smith, *DataComm for Business*
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.

Protocols

Instructor: Gil Blackburn and Jay Park, *BCI Technologies*
This course gives an overview of the protocols used with SCADA systems and discussion on advantages of the most common protocols.

SCADA Communication of the Future

Instructor: Kenneth Powell, *Siemens*
Take a look at what the future holds with regard to communication technologies. What will be the advantages of the next generation and how can the utilities utilize these new technologies. **Deploying a**

Managing Non-Operational Data

Instructors: Tony Wright, *Georgia Transmission Corp.*
Strategy for automating the retrieval and management of non-operational substation data is presented in this course. Study of how to manage the vast amount of non-operational data available to utilities. Non-operational data can be real time, historic, oscillographic data, event files, or any type of data not traditionally handled by RTUs or SCADA systems.

Smart Substation - SCADA Security & Field Trip

Instructor: Siemens
The Smart Substation is the next step of substation

automation in the Smart Grid landscape. Smart Station is the integral component of tying together the elements of operation, maintenance, efficiency, and safety. It consists of an integrated platform to provide local applications in the substation or to support applications in the back-office for expert analyses.

IP Networking

Instructor: Frank Hummel, *LAN Systems*
An overview of the solutions available for IP using high-speed networks like Ethernet or Frame Relay. Review of requirements for data, VoIP, and surveillance applications. Includes discussion on security and comparison of topologies, switches and routers, copper and optical connections.

Fiber Optic Communication Theory

Instructor: Emery Gary, *Corning Cable*
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: Emery Gary, *Corning Cable*
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: Lee Smith, *DC Systems*
Discussion of methods for automating distribution systems. The discussion includes devices, outage management, isolation and restoration, automatic switching, and capacitor bank control.

Self Healing Distribution Grid

Instructor: Van Holsomback, *Georgia Power Company*
Georgia Power has linked 38 protective devices with relays from different manufacturers into a self healing grid. Project challenges and expected results will be discussed.

Video Surveillance

Instructor: Rob Gornick; *Pivotal Vision*
How do we keep watch over our utility system? Learn how to monitor the video systems at your utility through your SCADA system. There will be discussion on who is already doing video surveillance and what they have learned.

Module 400: Engineering Topics

Generator Principles and Applications

Instructor: Keary Dosier, *Synergetic Design, Inc.*
This class will discuss the types of generators used on the utility system and at industrial sites. There will be discussion on emergency vs. standby,

environmental concerns, selection, uninterruptible power supplies and transfer switches.

Lighting Fundamentals

Instructor: Bob Petrivelli, *Booth Hinson Noack, Inc.*; Robin Johnson, *Equity Utility Service Co.*; Christine Thomas, *Eye Lighting International*
This class gives a comprehensive understanding of the theory and practice of utility lighting. There will be discussion on history of lighting, construction of lighting components, various poles and mounting hardware along with details of lamps. Learn the rule of thumb for lighting applications. Learn of the regulations of the lighting industry to include the Illuminating Engineering Society of North America (IESNA) and the International Dark Sky Association (IDA).

Protective Relaying - A Transmission Perspective

Instructor: Russell Patterson, *Tennessee Valley Authority (Retired)*
This class will be a discussion on coordination of protective relaying between the transmission system and the distribution protection at the utility interface. Discussion on settings and system modeling for protective relays.

Power Conductors

Instructor: Joe McAuliffe, *Southwire Company*
Learn about the cable that provides a means for the power to move through our utility systems. Topics to be discussed are shielded vs. non shielded, size and area relationship, conductor characteristics, and types of insulations. Discussion on new technologies for the future of power conductors.

Power Calculations

Instructor: Lee Layton, *Blue Ridge EMC*
This class will cover the fundamentals of electric power calculations. There will be calculations of power factor basics, transformers, metering, per phase analysis, and short circuit calculations.

Arc Flash Hazard Assessment

Instructor: Tim Wall, *Alabama Power Company*
This class will identify the common causes of an arc- flash. There will be a discussion of the regulations and standard requirements for performing an arc- flash hazard assessment. Discussion on compliance with OSHA, NFPA 70E, IEEE 1584, and NESC. Students will learn what is the proper personal protective equipment requirements for the arc- flash hazard.

Power Quality Issues and Solutions for Utility Distribution Systems

Instructor: Mark Halpin, *Auburn University*
This 4-hour class will provide an introduction to power quality. We will focus on typical problems that are associated with low power quality. Also in this module, we will separate "power quality" from "bad engineering" while providing numerous examples of each. Power quality topics discussed include voltage drop, harmonics, capacitor switching, grounding, and others.

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The Hotel at Auburn University, Auburn, Alabama

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 8th, 2008. 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 _____

Work Phone _____ Mobile Phone _____

Email _____

Industry Category

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

Registration Fees

- _____ \$295 Studentt*
_____ \$130 One Day Student (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 Exhibit Hall.

Pre-Registration Deadline is September 1st, 2008

Late and Onsite Registration are subject to an additional charge of \$30.

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, MasterCard, and American Express)

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 sedasc@utilitytech.org or contact **Suzanne Powell at (770) 519-1676**