

# Southeastern Meter School & Conference Class Schedule

## Monday, March 19th

Time	Module 100	Module 200	Module 300	Module 400	Module 500
10:00 - 1:00	Registration				
1:00 - 1:30	General Session				
1:30 - 3:00	<b>Smart Grid Data Privacy</b> Combined Class				
3:00 - 3:30	Networking and Refreshment Break				
3:30 - 4:30	Meter Safety Combined Class				
4:30 - 6:00	Exhibit Hall / Hospitality				

## Tuesday, March 20th

Time	Module 100	Module 200	Module 300	Module 400	Module 500
8:30 - 10:00	Electrical Fundamentals	Power Theory	Intro to Single & PolyPhase Field Meter Testing/ Fundamentals/ Philosophy	AMI Case Study- San Bernard Electric Cooperative	Meter Programming Itron
10:00 - 10:30	Networking and Refreshment Break in Exhibit Hall				
10:30 - 12:00	Single Phase Metering Theory	Principles of Polyphase Metering	Hands On Self- Contained Single & PolyPhase Meter Testing	AMI Case Study - Echo Power Engineering	Meter Programming Itron Continued
12:00 - 1:00	Lunch Provided				
1:00 - 2:30	Polyphase Metering Theory	Polyphase Metering Applications	Hands On Transformer Rated Solid State PolyPhase Meter Testing	AMI Case Study - Flint Energies	Meter Programming Elster
2:30 - 3:00	Networking and Refreshment Break in Exhibit Hall				
3:00 - 4:30	Single Phase Meter Testing	Reactive, KVA, and 4 Quadrant Metering	Meter Testing Program	AMI Case Study - Tri-State EMC	Meter Programming Elster Continued
4:30 - 6:00	Exhibit Hall / Hospitality				

**Attend Any Class You Want**

# Southeastern Meter School & Conference Class Schedule

## Wednesday, March 21st

Time	Module 100	Module 200	Module 300	Module 400	Module 500
8:30 - 10:00	Instrument Transformers Combined Class		Testing & Verification of Meter Installation Using Customer Load	AMI Case Study - Hart EMC	Meter Programming Landis + Gyr
10:00 - 10:30	Networking and Refreshment Break in Exhibit Hall				
10:30 - 12:00	Service Voltages/ Types & Form Numbers	Troubleshooting with Phasors	Testing & Verification of Meter Installation Using Customer Load Continued	AMI Case Study - Georgia Power	Meter Programming Landis + Gyr Continued
12:00 - 1:00	Lunch Provided				
1:00 - 2:30	Meter Socket Applications	Distribution Transformer Connections		AMI Case Study - Diverse Power	Meter Programming GE Digital Energy
2:30 - 3:00	Networking and Refreshment Break				
3:00 - 4:30	Demand / Time of Use Metering	Pulse Metering		Utility Roundtable Discussion	Meter Programming GE Digital Energy Continued
5:00 - 6:30	Annual Dinner at Alumni Center				
6:30 - 9:30	Casino Royale in Ballroom A				

## Thursday, March 22nd

Time	Module 100	Module 200	Module 300	Module 400	Module 500
8:30 - 9:30	Residential Theft Combined Class				
9:30 - 10:00	Networking and Refreshment Break				
10:00 - 11:00	Commercial Theft Combined Class				
11:00 - 12:00	Closing Session				

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## Opening Session

### **Smart Grid Data Privacy**

**Instructor:** Kevin Sullivan, *KEMA, Inc.*

There is ongoing debates taking place at the federal and state levels regarding customer privacy and data collected by smart meters. Traditionally, states are the testing ground for policy and regulation with federal institutions exerting influence of policy. Currently, different states are adopting different smart grid data policies. Will an approach emerge that has the consent of utilities, consumers, and regulators?

While much emphasis has been placed on the benefits of AMI / smart grid technology over the past few years, utilities are cognizant that the thorny issue of customer privacy cannot be ignored.

## Module 100

### **Fundamental Metering**

#### **Electrical Fundamentals**

**Instructor:** Mike Chirico, *South Alabama EC*

Learn the principles of electricity, AC and DC circuit theory including ohms law and circuit components, along with current and voltage laws. Review of basic meter math skills.

#### **Single Phase Meter Theory**

**Instructor:** Jack Pyburn, *Elster Electricity*

Explanation of the mechanics and electrical theory of single phase meters. Discussion of internal meter components, and how they interact to make the disk turn and register properly. Calculate watt-hour constants and register ratios of selected meters, along with dial multipliers and basic transformer factors.

#### **Polyphase Metering Theory**

**Instructor:** Will Grant, *Itron*

This class will introduce the student to the principles of polyphase metering. Explanations of different configurations and the uses for polyphase meters.

#### **Single Phase Meter Testing/Maintenance Hands On**

**Instructor:** Steve Shaw, *Georgia Power*

What does it mean to “test” a meter? This class includes discussion on testing methods and equipment along with ANSI requirements. Proper repair and maintenance of single phase meters are addressed.

#### **Instrument Transformers**

**Instructor:** David Ward, *GE Digital Energy*

Course is designed to teach the fundamental characteristics of Current and Potential Transformers as they are applied to electric metering. Topics include ratio, rating factor, BIL, burden, polarity and ANSI accuracy class.

#### **Service Voltages / Types & Form Numbers**

**Instructor:** Ken Waddleton, *Snapping Shoals EMC*

Focuses on service voltages and how they relate to meter selection. What is a meter “Form” and how does it relate to the type of service? Learn what does the nameplate information tell you. Overview of how meters, sockets and transformers are wired together? Although concentrating on single phase services, polyphase meter forms are also discussed.

#### **Meter Socket Applications**

**Instructor:** Chip Kanour, *Utility Specialists, Inc.*

A discussion on the components of a meter socket along with the importance of proper torque in electrical connections. Study of various standards and testing procedures on meter sockets.

#### **Demand / Time of Use Metering**

**Instructor:** Jay Gray, *Stuart C. Irby Co.*

Lecture on what “demand” is and why do utilities use demand metering. It will cover different types of demand metering and technologies. This class will also cover “Time of Use” (TOU) metering and related technologies. It will address questions on why we use TOU metering and its benefits.

## Module 200

### **Advanced Metering**

#### **Power Theory**

**Instructor:** Lee Allen, *Lanier Technical College*

An expansion of the popular course on the basics of electricity – volts, amps, power factor and all kinds of good stuff. Definition and applications of KW, KVA, power factor, reactive power, and demand. Introduction to complex math and phasors.

#### **Principles of Polyphase Metering**

**Instructor:** Randy Riley, *Landis + Gyr*

Lecture on “What is polyphase metering.” Why does the customer need this type of metering? Evolution of polyphase metering. Polyphase meter wiring connections are discussed.

#### **Polyphase Metering Application**

**Instructor:** Larry Waters, *GE Digital Energy*

A review of delta and wye metering applications, 2,2-1/2 and 3 element meter selection, “multi-form” meters and Blondel’s Theorem. The participant will have the opportunity to work on several meter application problems in order to assess his/her own skill level.

#### **Reactive, KVA and 4 Quadrant Metering**

**Instructor:** Victor Love, *Schweitzer Engineering Labs*

Explore reactive metering concepts and terminology. Look at why reactive measurements are important, their impact on system losses, equipment sizing, and cost of service. Review the mathematical derivation of reactive quantities. Explanation of 4 Quadrant metering.

#### **Instrument Transformers**

**Instructor:** David Ward, *GE Digital Energy*

Combined with Module 100 class

#### **Installation Troubleshooting Using Phasors**

**Instructor:** Larry Waters, *GE Digital Energy*

An introduction to the concept of phasor diagrams – what they represent, how they are developed, and how they may be used as effective diagnostic tools. Working with phasor information provided by new solid state electricity meters to troubleshoot new and Existing metering installations. Includes some interactive exercises diagnosing miswired meters.

#### **Distribution Transformer Connections**

**Instructor:** Tony Kiser, *Georgia Power*

Lecture on the understanding of distribution transformer connections and how to make them. A necessity to a well rounded meter person.

#### **Pulse / Load Profile Metering**

**Instructor:** Frank Lopez, *Electric Supply, Inc.*

What is pulse metering? When, why, and how you would use it in a modern day metering system. Explanations of pulse initiators, isolation relays, and pulse weight calculations.

## Module 300

### **Meter Testing & Safety**

#### **Meter Safety**

**Instructor:** Jim Kimberly, *Georgia Power*

The check out procedures for self-contained meter sockets and the results of a fault in a self-contained meter socket. Demonstrations of the proper use of protective equipment and fire retardant clothing while working in reach of an energized circuit. Discussions on various accidents experienced by meterman. Safety precautions while working inside a substation.

#### **Intro to Single Phase and PolyPhase Field Meter Testing / Fundamentals / Philosophy**

**Instructor:** David Philpott, *Georgia Power*

Discussion on the Basic Theory, Philosophy, and ANSI Standards necessary to complete single phase and three phase meter testing. Includes details of phantom load testing and customer load testing.

#### **Hands On Self-Contained Single Phase and PolyPhase Meter Testing**

**Instructors:** Steve Shaw, Tony Moore, Dwayne

Harrington, Jamie Pulliam, *Georgia Power*

Hands on lab allowing students to test mechanical and electronic self-contained watt-hour meters using phantom load and portable watt-hour standard.

#### **Hands On Transformer Rated Solid State PolyPhase Meter Testing**

**Instructors:** Steve Shaw, Tony Moore, Dwayne

Harrington, Jamie Pulliam, *Georgia Power*

Hands on lab allowing students to test electronic transformer rated watt-hour meters. Using phantom load and portable watt-hour standard, three portable watt-hour standards, and newer technology test equipment. Testing from infrared test LED.

**Meter Testing Program**

**Instructor:** Cliff Hand, *Georgia Power*

Discussion on the benefits of a Meter Testing Program. Discussion will include ANSI Standards, Maintaining Compliance, Revenue Optimization and Trending Data. In addition, discussion will include how AMI meters have changed shop testing requirements.

**Testing and Verification of Meter Installation Using Customer Load**

**Instructors:** Dwayne Harrington, Jamie Pulliam  
*Georgia Power*

Demonstration on how to properly check your overall meter installation and be assured of accurate billing. Class will include vector analysis, voltage measurement, CT burden verification and verifying CT ratios using latest test equipment and classroom discussion.

**Residential Theft**

**Instructor:** Greg Lee, *Georgia Power*

The loss of revenue through unsecured meters, the use of tap detectors, the use of check meters and other methods of theft detection, the meterman's role in revenue protection, and how investigations are completed after a theft case is discovered.

**Commercial Theft**

**Instructor:** Greg Lee, *Georgia Power*

Detection of loss of revenue due to theft on Commercial accounts. Ways to prevent loss of revenue due to theft of services on Self Contained Polyphase and Instrument Transformer Rated accounts.

**Module 400**

**Utilizing AMI Beyond the Meter Read Case Studies**

**AMI Case Study - San Bernard Electric Cooperative**

**Instructor:** Doug Lambert, *San Bernard EC, Steve Collier, Milsoft*

This case study will cover the utilities integration of AMI to Outage Management and CIS using the MultiSpeak Protocol. There will be a few videos demonstrating the end-user's experience with using the integration for better customer service and more accurate reporting of outages. Also show how the utility is using tamper alarms (coming into the Outage system through MultiSpeak) to discover possible theft of service. A discussion on how they have saved money and wasted trips by determining, through the integration, that the member's breaker was tripped and there was not a legitimate outage. Utility will also show how they are plotting the data to their field map viewers for helping the technicians in the field with streamlining the deployment process and CSR's with answering questions to the public about the progress of the deployment. Also show how the utility is using an interactive map on the utility website to inform the public about the progress of the AMI deployment. Will show the customer web presentation of

energy usage using a MDMS. A discussion on how they keep their databases (CIS,AMI, and OMS) synchronized with MultiSpeak requiring less data entry (no duplication of processes) and minimizing the opportunities for human error in input.

**AMI Case Study - ECHO Power Engineering**

**Instructor:** Scotty Carrol, *ECHO Power Engineering*

ECHO Power recently completed a distributed metering project for NASA's Marshall Space Flight Center in Huntsville, AL. The project used thirty-five meters on the medium and low voltage distribution system to compute a single bill, including 30 minute demand and time-of-use billing for over 200 facilities. The meters communicate wirelessly to two independent SCADA systems and the billing is automated using a mix of off-the-shelf and custom software. This session will explain the approach used to solve this complex metering application, including the hardware and software that made it all possible.

**AMI Case Study - Flint Energies**

**Instructor:** Ty Diamond, *Flint Energies*

Remote meter reading and Smart Meters have taken on various meanings over the past few years. This presentation will present the different benefits a utility can receive from an intelligent smart meter system. Areas discussed will include load management, meter reading, outage management, engineering analysis, voltage surveys, theft detection, etc. What a Smart Metering System will normally interface with inside the utility. The advantages and pitfalls of installing a system from a user's standpoint along with a discussion of the Smart Grid demonstration project going on at Flint Electric Membership Corporation will be presented.

**AMI Case Study - Hart EMC**

**Instructor:** Russell Shirley, *Hart EMC*

Now that the meter has been transformed into a communication platform what will you do with that data? This session will show what one Cooperative has done with some of that data and how they turned data into information. The focus will be on outage detection and restoration but time permitting other topics such as line loss will be discussed. To use the meter for OD (outage detection) in a way that gives your utility a positive return on the investment in time and money it takes careful preparation and ongoing maintenance to any AMI deployment. It is hoped that this session will help you create your roadmap to OD success.

**AMI Case Study - Georgia Power**

**Instructors:** Mitch Cason, Van Holsenbeck  
*Georgia Power*

There are many additional benefits that can be realized using the AMI meter data. Topics of this presentation will be on: Using voltage

data to 1) ensure the correct meter is set in the socket 2) it's wired properly 3) transformer failure (high/low voltage). Also a discussion on using lost phase voltage alarms to identify revenue loss and tamper alarms. The utility is also testing load profile and encryption with some good results. An additional presentation topic will be adapting standard AMI meters to monitor the health of capacitor banks.

**AMI Case Study - Diverse Power**

**Instructor:** Randy Shepard, *Diverse Power*

Since the implementation of a single power line carrier solution, the utility has utilized the system well beyond the "billing reads" capability. From the beginning, they have read every meter, every hour of every day. This allows significant data to do the following items: 1) Tamper detection, 2) Transformer loading, 3) Engineering load studies, 4) Load balancing 5) Outage analysis and restoration verification, and 6) High bill resolution. Experiences will be shared about the system along with the development and use of the systems that have been put into place to work with the data.

**AMI Case Study - Tri-State EMC**

**Instructor:** David Lewis, *Tri-State EMC*

This session highlights value added benefits of an AMI system that go far beyond remote meter reading. Learn how Tri-State EMC was awarded a U.S Department of Energy Smart Grid Investment Grant and completed a \$2.4 Million AMI project that allows them to offer customers usage monitoring, pre-pay metering, and Time of Use metering. Discussion about how their AMI system helps with outage detection/management as well as reduce operating costs through remote disconnects/reconnects, theft detection, and improved power quality monitoring.

**Utility Round Table Discussion**

This will be an open forum for metering technicians, engineers and managers to discuss the status of the electric metering industry. Be ready to share your issues with peers of the utility industry. This session will be open to only utility personnel.

**Module 500**  
**Meter Programming**

Overview and hands on programming of manufacturers metering software. You will be creating and editing meter programs.

**Laptop computers are provided but students can bring their own.**

**Meter Programming – Elster**

**Meter Programming – GE Digital Energy**

**Meter Programming – Itron**

**Meter Programming – Landis + Gyr**