

Power Systems 2009 Conference  
*Advanced Metering, Protection Control, Communication and  
Distributed Resources*

March 10-13, 2009  
Madren Center, Clemson University,  
Clemson, SC, USA



Electric Power Research Association



# PSC09 TECHNICAL PROGRAM

**Tuesday, March 10, 2009**

7:30 -

**Registration**

**Location:** Terrace Hallway

8:00 – 1:00

**Tutorials A & B**

## **Tutorial A: “Innovations You Can Use Today”**

**Chairman:** Roy Moxley, SEL

**Location:** Ballroom A

- Welcome and Company Update
- Improve Arc Flash Safety
- Smart Grid Solutions
- Synchrophasors for Control, Protection, Energy Management and Recording
- Distributed Generation Interconnection

## **Tutorial B: “Introduction to Generator Protection”**

**Chairman:** Mark Adamiak, GE Multilin

**Location:** Ballroom C

Introduction to Generator Protection will provide an overview of the concepts behind generator protection. This tutorial will discuss topics related to:

- Generator Grounding
- Generator Operations
- Generator Protection

The Generator Protection section describes methods to protect generators against electrical failure and abnormal operating conditions, and will specifically discuss:

- Stator Ground Fault
- Stator Differential
- Loss of Field
- Inadvertent Energizing

Lunch will be served in Ballroom B

Golf starts at 1:30

**Reception:** 4:30 – Dark

**Location:** Pavilion

**Wednesday, March 11, 2009**

7:30 - **Registration**  
**Location:** Terrace Hallway

8:00 – 8:15 **Welcoming and Introduction**  
Adly Girgis and Esin Gulari, Dean of Engineering and Science,  
Clemson University  
**Location:** Bellsouth Auditorium

8:15 – 8:45 **Keynote Speech: “SMART GRID—Is the Technology Ready and What is the Value Proposition?”**  
Mark Wyatt, VP, Smart Energy Systems, Duke Energy  
**Location:** Bellsouth Auditorium

**Wednesday, March 11, 2009 9:00 – 11:45**

**Panel Discussion, PD1**  
**“Our Role in the Smart Grid Evolution”**

**Chairman:** Tim Morgan, Duke Energy

**Location:** Bellsouth Auditorium

**Panelists:**

- “Our Role in Smart Grid Evolution”, Tim Morgan, Duke Energy
- “Building the Intelligent Utility in the Midst of Great Uncertainty”, Warren Causey, Sierra Energy Group
- Bob Gustin, Sprint Nextel
- Mike Burns, Itron
- Tony Bamonti, Tendril Networks, Inc.
- Gavin McFarlane, Cooper Power

**Wednesday, March 11, 2009 9:00 – 11:45**

**Technical Paper Session TP1**  
**“Synchrophasors Functionality and Applications”**

**Chairman:** Anthony Johnson, SCE

**Location:** Ballroom A

- **“Synchro-Phasor Based Voltage and Var Management”**  
Anthony Johnson, Southern California Edison
- **“Testing Phasor Measurement Units”**  
Alexander Apostolov, Omicron
- **“Design and Implementation of an Industrial Facility Islanding & Load Shed System”**  
Mark Adamiak and Bernard Cable, GE; Michael Schiefen and Gary Schauerma, BASF
- **“Phasor Measurements Units: Functionality and Applications”**  
Damien Tholomier, AREVA-TD
- **“Meeting NERC Requirements for Oscillography and Disturbance Monitoring by Collecting Data from Relays”**  
Charles Jones, American Electric Power, Declan Smith, Tarigma Corp. and Jim Schnegg, SEL

**Wednesday, March 11, 2009 9:00 – 11:45**

**Tutorial C:  
“On-Line Instability and PMU”  
Chairman: Damien Tholomier, AREVA  
Location: Ballroom C**

- Online Stability solutions in a control center.
- An integral part of the SmartGrid initiative.
- Model-based analysis versus Measurement-based analysis..
- Beneficial impacts of PMUs.
- Substation-based Defense plans for localized grid protection.
- Adaptive real-time grid protection and islanding schemes.
- State Estimator with PMUs.
- Advanced Visualization tools & techniques for system operators.

**Wednesday, March 11, 2009 11:45 – 2:30**

**Exhibit Area Presentations**

SEL:	“State of the Art in Microprocessor Based Relays
GE Multilin	“Power System Control and Protection”
Siemens:	“Substation Automation”
Itron:	“Advanced Metering for the Smart Grid”
Elster:	“Advanced Metering for the Smart Grid”
AREVA:	“SCADA and Automation”

12:30 – 2:00

**Lunch**

**Keynote Speech: “The Smart Substation-A Building Block of a Smart Grid”**

Juan Macias, GE Multilin

**Location:** Ballroom B

2:00 – 5:00

**Technical Paper Sessions**

**Wednesday, March 11, 2009 2:00 – 5:00**

**Panel Discussion, PD2  
“Smart Grid Demonstration Projects Focused on Large Scale Resource Integration”**

**Chairman:** Mark McGranaghan, EPRI

**Location:** Bellsouth Auditorium

**Panelists:**

- Overview of the EPRI Smart Grids Demonstration Initiative – Matt Wakefield, EPRI
- Modern Grid Strategy (MGS) Developmental Field Test (DFT) Results – Joe Miller, Horizon Energy Group
- Smart Energy. Now. - Tim Morgan, Duke Energy
- Architecture for Distributed Energy Resource Control including Demand Response and Distribution Automation at FirstEnergy – Joe Waligorski, FirstEnergy
- AEP GridSmart Program – Tom Weaver, AEP, with introduction to technologies used in the project by Ken Caird, GE

**Wednesday, March 11, 2009 2:00 – 5:00**

**Tutorial D**  
**“Security Concerns for Protection Engineers”**

**Chairman:** Brent Duncan, Siemens

**Location:** Ballroom A

- Complex Communication Systems
- Security Blue Print
- Why IT Security-reliability
- Cyber Security - Threat potential
- Damage scenarios –What can happen?
- Malicious Attacks
- Physical Security
- International IT Security Standards
- NERC CIP Requirements

**Wednesday, March 11, 2009 2:00 – 5:00**

**Technical Paper Session TP2**  
**“IEC 61850 Architecture and Applications”**

**Chairman:** Mark Adamiak, GE

**Location:** Ballroom C

- **“An Optimized Architecture for IEC 61850 Process Bus”**  
Mark Adamiak, Bogdan Kasztenny and David McGinn, GE
- **“IEC 61850 Process Bus Solution Addressing Business Needs of Today’s Utilities”**  
Rich Hunt, Bogdan Kasztenny, Steve Hodder and David McGinn, GE
- **“Modeling Systems with Distributed Generators in IEC 61850”**  
Alexander Apostolov, Omicron
- **“Relay Parameterization Made Easy with a Universal XML Interface”**  
Brent Duncan, Siemens

**Wednesday, March 11, 2009 5:00 – 6:00**

**Exhibit Area Presentations**

SEL: “State of the Art in Microprocessor Based Relays”  
GE Multilin “Power System Control and Protection”  
Siemens: “Substation Automation”  
Itron: “Advanced Metering for the Smart Grid”  
Elster: “Advanced Metering for the Smart Grid”  
AREVA: “SCADA and Automation”

**Thursday, March 12, 2009**

7:30 - **Registration**  
**Location:** Terrace Hallway

8:00 – 8:15            **Welcoming and Introduction**  
Adly Girgis and Dori Helms, Provost, Clemson University  
**Location:** Bellsouth Auditorium

8:15 – 8:45            **Keynote Speech: “Planning in a Changing World”**  
Bob Long, General Manager of Resource Planning, SCE&G  
**Location:** Bellsouth Auditorium

9:00 – 11:45           **Technical Sessions**

**Thursday, March 12, 2009 9:00 – 11:45**

**Technical Paper Session TP3**

**“Line Protection”**

**Chairman:** Juergen Holbach, Siemens

**Location:** Ballroom A

- **“Detection of Incipient Faults in Underground Medium Voltage Cables”**  
Bogdan Kasztenny and Iliia Voloh, GE; Christopher Jones, Bronx/Westchester Engr.
- **“Secure Data Communication for Line Differential Relays”**  
Norbert Schsuter, Arnd Struecker and Juergen Holbach, Siemens
- **“Tests of Distance Relay Performance on Stable and Unstable Power Swings Reported Using Simulated Data of the August 14, 2003 System Disturbance”**  
Laurie Martuscello, TRC Solutions, Edward Krizauskas, NYSEG, Juergen Holbach and Yuchen Lu, Siemens
- **”Adaptive Protecting of Transmission Lines”**  
Damien Tholomier, AREVA T&D
- **“Updated Transmission Line Protection Communications”**  
Roy Moxley, Ken Fodero and Hector Altuve, SEL

**Thursday, March 12, 2009 9:00 – 11:45**

**Panel Discussion, PD3**

**“Plug-In Hybrid Electric Vehicles”**

**Chairman:** Jason Taylor, EPRI

**Location:** Bellsouth Auditorium

**Panelists:**

- Jason Taylor, EPRI
- Jose Salazer, Southern California Edison
- Mike Rowand, Duke Energy
- Paul Venhovens, Clemson University ICAR

**Thursday, March 12, 2009 9:00 – 11:45**

**Technical Paper Session TP4  
“Generator and Bus Protection”**

**Chairman:** Damien Tholomier, AREVA

**Location:** Ballroom C

- “Report on Design, Testing and Commissioning of 100% Stator Ground Fault Protection at Dominion Energy Bath County Pumped-Storage Station”  
John Kandrac and Richard Preston, Siemens
- “Comparison Between High Impedance and Low Impedance Bus Differential Protection”  
Juergen Holbach, Siemens
- “Protection Requirement for a Large Scale Wind Park”  
Shyam Sundar, Siemens
- “Protection of Distributed Generators Interconnection”  
Damien Tholomier, AREVA T&D
- “Analysis of Capacitive Voltage Transformer Transients with Wind Farm Integration”  
Viraj Pradeep Mahadanaarachchi and Rama Ramakumar, Oklahoma State University

**Thursday, March 12, 2009 11:45 – 12:30**

**Exhibit Area Presentations**

SEL: “State of the Art in Microprocessor Based Relays”  
GE Multilin “Power System Control and Protection”  
Siemens: “Substation Automation”  
Itron: “Advanced Metering for the Smart Grid”  
Elster: “Advanced Metering for the Smart Grid”  
AREVA: “SCADA and Automation”

12:30 – 2:00

**Lunch**

**Keynote Speech:**

**“Renewable Energy – The Road Ahead”**

Lonnie Carter, President and CEO, Santee Cooper

**Location:** Ballroom B

2:00 – 5:00

**Technical Sessions**

**Thursday, March 12, 2009 2:00 – 5:00**

**Panel Discussion, PD4**

**“Planning for Increased Renewable Energy Portfolio”**

**Chairman:** Carl L. Wilkins, Quanta Technology

**Location:** Bellsouth Auditorium

**Panelists:**

- “Planning for Increased Renewables”, Carl L. Wilkins, Quanta Technology
- “Technical Aspects of Utility Interconnection for Small Independent Power Producers”,  
John W. Gajda, Progress Energy
- Bartosz Wojszczyk, Quanta Technology
- Mike Grant, Duke Energy

Thursday, March 12, 2009 2:00 – 5:00

**Technical Paper Session TP5**  
**“Distribution Systems Protection and Power Quality”**

**Chairman: Eli Nelson, SEL**

**Location: Ballroom A**

- **“Effects of Wide-Area Control on the Protection and Operation of Distribution Networks”**  
Will Allen, SEL
- **“Distribution Automation Helps Revitalize Community”**  
Ernie Gorrell, Pike Elec. Inc., James Niemira, S&C Electric Company, Eli Nelson, SEL
- **“Distribution Single-Phase Tripping and Reclosing: Overcoming Obstacles with Programmable Recloser Controls”**  
Robert Cheney and John Thorne, Alabama Power Company, Greg Hataway, SEL
- **“Dispersed Generation Impact on Distribution Network Expansion Planning”**  
Mohammed El-Sayed, University of Trinidad and Tobago

Thursday, March 12, 2009 5:00 – 6:00

**Exhibit Area Presentations**

SEL: “State of the Art in Microprocessor Based Relays”  
GE Multilin “Power System Control and Protection”  
Siemens: “Substation Automation”  
Iron: “Advanced Metering for the Smart Grid”  
Elster: “Advanced Metering for the Smart Grid”  
AREVA: “SCADA and Automation”

6:30 – 7:00 **Social**

7:00 **Banquet**  
**Keynote Speech: "Innovative Solutions for Today's Smart Grid"**  
Ed Schweitzer, President, SEL  
**Location: Ballroom B**

**Friday, March 13, 2009**

8:00 – 8:15 **Welcoming and Introduction**  
Adly Girgis, Clemson University  
**Location: Bellsouth Auditorium**

8:15 – 8:45 **Keynote Speech: “AMI and the Smart Grid”**  
Mike Longrie, VP, Elster Electricity

9:00 – 12:00 **Technical Paper Sessions**

**Friday, March 13, 2009 9:00 – 12:00**

**Technical Paper Session TP6  
“The Smart Grid”**

**Chairman:** Mark Zeller, SEL

**Location:** Ballroom A

- “Add Trip Security to Arc Flash Detection for Safety and Reliability”  
Mark Zeller and Gary Scheer, SEL
- “Review of Available Transmission Capability (ATC) Calculation Methods”  
Manish Patel, Clemson University
- “Fast Prediction of the Power-Swing Curve Across Transmission Lines During Wide Area Disturbance”  
Tom Baldwin and M. A. Danku, Florida State University

**Friday, March 13, 2009 9:00-12:00**

**Panel Discussion, PD5  
“AMI and the Smart Grid”**

**Chairman:** Mike Longrie, Elster Electricity

**Location:** Bellsouth Auditorium

- “Perspectives from EPRI on the Smart Grid and AMI”, Brian Seal, EPRI
- “Experiences with an AMI System at Mid-Carolina Cooperative”, Lee Ayers, Mid-Carolina Cooperative
- “Using AMI to Realize the Smart Grid”, Mike Longrie, Elster
- “Utility Drivers for the Smart Grid”, Bartosz Wojszczyk, Quanta Technology

12:00 – 2:00

**Lunch, Acknowledgements and Distribution of Certificates of CEUs**

**Location:** Ballroom B