

Draft I

**Power Systems 2007 Conference**  
*Advanced Metering, Protection Control, Communication and  
Distributed Resources*

**March 13-16, 2007**  
**Madren Center, Clemson University,**  
**Clemson, SC, USA**

**SPONSORS**



**DRAFT 1**

**PSC07 TECHNICAL PROGRAM**

**TUESDAY**

**MARCH 13, 2007**

7:30 -

**Registration**

**Location:** Terrace Hallway

8:30 – 4:30

**Preconference Tutorials A&B**

8:30 -

**Tutorial A: “Real Engineering, Real Solutions – Serious Training for Your Power System Protection Challenges.”**

Schweitzer Engineering Laboratories

**Location:** Ball Room A

8:30 – 8:45

**Welcoming and Introduction**

Adly Girgis, Clemson University and Charles Hardy, SEL

**Location:** Ballroom A

- Test the Right Stuff: Assessing your Protection System
- Synchrophasors: Practical Applications for Installation Today
- Video Presentation of Standards Testing
- SEL Complete Solutions for Generator Stations—Generator, Field and Thermal Protection

12:00 – 1:00

**Lunch**

**Location:** Ballroom B

- Keeping the Lights On—Reduce Feeder Downtime by 60 Percent
- The Perfect Time: An Examination of Time Synchronization Techniques
- Distribution Protection Using the SEL-351 Family of Relays
- Finding Root Cause: Analyzing Event Reports

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8:30 – 4:30

**Tutorial B: “State of the Art in Power Systems Communications, Control and Protection”**

GE

**Location:** Ball Room C

8:30 – 8:45

**Welcoming and Introduction**

Elham Makram, Clemson University and Wayne Hartmann, GE

- Advanced Capacitor Protection & Control
- Synchrophasor System Configuration & Applications

12:00 - 1:00

**Lunch**

**Location:** Ballroom B

- Advanced Power Transformer Protection & Monitoring
- Substation Automation Techniques and Applications

4:30 - Informal discussions with Tutorials' Instructors

Exhibitors: May set up the exhibits any time before the COB on Tuesday.

**WEDNESDAY      MARCH 14, 2007**

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

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

8:15 – 8:45            **Keynote Speech: “Back To The Future”**  
Susie Adams, Vice President, Duke Energy  
**Location:** Bellsouth Auditorium

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

<p><b>Tutorial “D”</b>  <b>DISTRIBUTION AUTOMATION</b>  John McDonald, President, IEEE/PES, KEMA  <b>Location:</b> Bellsouth Auditorium</p>	
9:00 a.m.	<p><b>What is Distribution Automation?</b></p> <ul style="list-style-type: none"> <li>• Feeder, Substation and Customer Automation</li> <li>• Distribution Automation Definition</li> </ul>
9:15 a.m.	<p><b>Equipment for Feeder Automation</b></p> <ul style="list-style-type: none"> <li>• Fault Location, Isolation, and Service Restoration (FISR)</li> <li>• Other Uses of Automated Switches</li> <li>• System Components</li> <li>• Communication Facilities</li> <li>• Control Panels</li> <li>• Feeder Automation Categories <ul style="list-style-type: none"> <li>• Manual</li> <li>• Semi-Automatic</li> <li>• Fully Automatic</li> </ul> </li> <li>• Feeder Automation Approaches <ul style="list-style-type: none"> <li>• Centralized</li> <li>• Substation Centered</li> <li>• Peer-to-Peer</li> </ul> </li> <li>• Training Simulator</li> <li>• Practical Matters</li> </ul>

- 10:05a.m.           **Feeder Automation Functions**
- VAR Dispatch
  - Voltage Control (Conservation Voltage Reduction)  
Integrated Volt VAR Control (IVVC)
- 11:00 a.m.           **Enterprise Level Substation Integration and Data Management**
- Overview
  - Substation
  - Communication Infrastructure
  - Enterprise Data Management/Data Mart
  - Business Processes
  - Implementation
  - Applications
- 11:45 a.m.           **Tutorial Adjourn**

**TECHNICAL PAPER SESSION TP1  
IMPROVING SYSTEM RELIABILITY VIA POWER SYSTEM PROTECTION**

**Chairman:** Jim Buff, SEL

**Location:** Ballroom A

- **Introduction to Basic Fault Tree Analysis for Protective Relaying Applications**  
Robert Beresh, Kinectrics
- **Application of Existing Technologies to Reduce Arc-Flash Hazards**  
Jim Buff & Kari Zimmerman, SEL inc.
- **Dynamic Simulations Help Improve Generator Protection**  
Amando Guzman, SEL, Inc. & Ramon Sandoval, Mexico
- **Undervoltage Load Shedding**  
Chuck Mozina, Beckwith Electric
- **Effect of System Decomposition on Two-Level State Estimation**  
Manish Patel & Adly Girgis, Clemson University
- **Improved Service Reliability for Rural Electric Customers – Innovative Auto Restoration Following Loss of Primary Source Interconnection**  
Sam Fulford & Nicholas Seeley, SEL & James Rice, Plumas\_Sierra Rural Elec. Coop.

**Panel Discussion PD1**  
**ADVANCED METERING**  
**Chairman:** David Hart, Elster Electricity  
**Location:** Ballroom C

Panelists:

- **OMS and AMI Systems to Improve Customer Service Following an Outage**  
William Peterson, ABB
- **Elster Energy Axis Pilot at Duke Energy**  
Wes Ray, Duke Energy
- **IP Communication Efforts Between SC Coop. and Santee Cooper**  
David (Buck) Springs, Central Electric Coop.

11:45 – 12:30

**Exhibit Presentations**

SEL:

Advanced Protection, Control and Metering

GE:

Power System Communication, Control and Protection

SIEMENS:

Power System Automation

ITRON:

Advanced Metering

AREVA:

TBA

ELSTER:

Advanced Metering and Network Management

ABB:

Network Manager DMS

SANTEE COOPER: Solar Energy and Green Power

12:30 – 2:00

**Lunch**

**Location:** Ball Room B

**Keynote Speech: “Managing the Talent Challenge”**

Wanda Reder, President Elect - IEEE/PES, Vice President – S&C Electric Company

2:00 – 5:00

**Technical Paper Sessions**

**Panel Discussion PD2**  
**THE BUSINESS CASE FOR DISTRIBUTION AUTOMATION**

**Chairman:** Mark McGranaghan, EPRI

**Location:** Bellsouth Auditorium

- Reliability Improvement
- Reducing Losses
- Enabling Integration of DG
- Regulatory Implications
- Roadmap for automating distribution systems

**Technical Paper Session TP2**

**ADVANCEMENT IN DISTRIBUTION AND TRANSMISSION SYSTEM PROTECTION**

**Chairman:** Juergen Holblach, Siemens PT&D, Inc.

**Location:** Ballroom A

- **Spline Function Based Technique for Sensitizing of Ground Overcurrent Relays for Sub-Transmission and Distribution Lines**  
Abhishek Khanna, Power Grid, India
- **Characterizing Distribution System Overcurrents Using Expert Systems**  
Daniel Fischer, Robert Beresh, Kinectrics
- **Detection of High-Impedance Faults in Power Distribution Systems**  
Daqing Hou, SEL
- **AEP Experience With Protection of Phase Angle Regulating Transformers**  
Michael Thompson, SEL, Hank Miller and John Burger, AEP
- **A Microcomputer Based Unique Medium Voltage Distribution Line Fault Diagnostic System**  
Sudipta Nath, Abhijit Chakrabarti, A. K. Mukhopadhyay
- **Precise Distance to Fault Locator with Two End Phasor Measurement Transmitted Via Serial Protection Data Interface**  
Juergen Holbach, Siemens PT&D, Inc.

**Technical Paper Session TP3**  
**ADVANCED METERING**  
**Chairman:** Aaron Snyder, ITRON  
**Location:** Ballroom C

- **ANSI C12.19 and the Utility Enterprise**  
Aaron Snyder, Pedro Ramirez, ITRON
- **The ANSI C12 Protocol Suite-Updated and Now with Network Capabilities**  
Aaron Snyder, Michael T. Garrison Stuber, ITRON
- **Emerging European Influence on International Metering Type Testing**  
Aaron Snyder, Jaime Ramirez, ITRON
- **City of Naperville Embraces IEC 61850 Philosophy, A Case Study of Implementation**  
Brent Duncan and Dan Gacek, SIEMENS PT&D, Inc.
- **Dairyland Power Installs Multifunction High-End Meters and Expanded Wide Area I/P Communications**  
Ed West and Ken Graves, Dairyland Power Coop. and Dick Martin, SEL

5:00 – 6:00

**Exhibit Presentations**

SEL: Advanced Protection, Control and Metering

GE: Power System Communication, Control and Protection

SIEMENS: Power System Automation

ITRON: Advanced Metering

AREVA: TBA

ELSTER: Advanced Metering and Network Management

ABB: Network Manager DMS

SANTEE COOPER: Solar Energy and Green Power

**THURSDAY                    MARCH 15, 2007**

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

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

8:15 – 8:45            **Keynote Speech: “Micro-Grid Operation, Control and Protection”**  
Mark Adamiak, GE  
**Location:** Bellsouth Auditorium

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

**PANEL DISCUSSION PD3  
COORDINATION OF GRID IMPROVEMENT INITIATIVES**

**Chairman:** Eric Gunther, Enernex Corporation

**Location:** Bellsouth Auditorium

- **Intelligrid Program**  
Mark McGranaghan, EPRI
- **Gridwise Interoperability Framework**  
Steve Widergren, Pacific Northwest National Laboratory
- **Collaborataing to Modernize the Grid**  
Steven Pullins, SAIC/Horizon Energy
- **UCA International Users Group**  
Kay Clinard, Clinard and Associates

**PANEL DISCUSSION PD4  
INDUSTRIAL POWER SYSTEMS, CHALLENGES AND OPPORTUNITIES**

**Chairman:** Adly Girgis, Clemson University

**Location:** Ballroom A

- TBD  
Charles Hardy, SEL
- TBD  
Wayne Hartmann, GE
- TBD  
Juergen Holbach, Siemens PT&D, Inc.

**Technical Paper Session TP4  
ADVANCEMENTS IN SYSTEM PROTECTION**

**Chairman:** Mark Adamiak, GE

**Location:** Ballroom C

- **High-Speed Control Scheme to Prevent Instability of a Large Multi-Unit Power Plant**  
Vahid Madani, Edward Taylor, Davis Erwin, Anatoliy Meklin, Pacific Gas and Electric Company and Mark Adamiak, GE
- **Fundamentals of Adaptive Protection of Large Capacitor Banks**  
Bodgan Kasztenny, Joe Schaefer and Ed Clark, GE  
(Presented by Rich Hunt, GE)
- **Monitoring Ageing CCVTs (Practical Solutions with Modern Relays to Avoid Catastrophic Failures)**  
Bodgan Kasztenny, GE  
(Presented by Rich Hunt, GE)
- **On the Standardization of Distance Characteristics**  
Alex Apostolov, AREVA
- **Synchrophasors: A Primer and Practical Applications**  
Jon Sykes, Kristian Koellner, William Premerlani, Bogdan Kasztenny and Mark Adamiak, GE
- **International Collaboration in Synchronized Measurement Experiment in Russia**  
Andrey Grobovoy and Natalia Bondareva, IEEE, Vladimir Stephanov, ABB Corp., Russia and Edsel Atienza, SEL

11:45 – 12:30

**Exhibit Presentations**

SEL: Advanced Protection, Control and Metering

GE: Power System Communication, Control and Protection

SIEMENS: Power System Automation

ITRON: Advanced Metering

AREVA: TBA

ELSTER: Advanced Metering and Network Management

ABB: Network Manager DMS

SANTEE COOPER: Solar Energy and Green Power

12:30 – 2:00

**Lunch**

**Location:** Ballroom B

**Keynote Speaker:** Ed Schweitzer, President and CEO, Schweitzer Engineering Laboratories

2:00 – 5:00

**Technical Sessions**

**TUTORIAL C**

**CYBER SECURITY FOR CONTROL AND PROTECTION**

Jason Stamp, Sandia National Laboratories

**Location:** Bellsouth Auditorium

This tutorial presents best practices for effective and sustainable automation security throughout a system's lifecycle. The seminar introduces common vulnerabilities of these systems and the presents suggested security requirements. Furthermore, NERC Critical Infrastructure Protection (CIP) standards are presented and analyzed to develop a profile of control objectives for cyber security. Finally, the administrative, procedural, and technical security controls specified by CIP are discussed, along with practical suggestions and best practices to ensure improved automation security.

**TECHNICAL PAPER SESSION TP5**

**ADVANCED COMMUNICATION, IEC 61850 IN METERING AND PROTECTION**

**Chairman:** Elham Makram, Clemson University

**Location:** Ballroom C

- **Testing Requirements for IEC 61850 Based Devices**  
Alex Apostolov, AREVA
- **Status on the First IEC 61850 Based Protection and Control, Multi Vendor Project in the United States**  
Steve Kunsman, Elmo Prive, ABB, Alex Apostolov, AREVA, Rich Schaal, Affiliation, Craig Wester and Mark Adamiak, GE, Juergen Holbach and Howard Self, SIEMENS PT&D, Inc.
- **Using Time Error Differential Measurement in Protection Applications**  
Roy Moxley & Mirek Wronski, SEL, Inc.
- **Tutorial: From the Steinmetz Model to the Protection of High Inertia Loads**  
Stanley Zocholl, SEL, Inc.  
(Presented by Ed Lebenhaft, SEL)
- **Lessons Learned through Commissioning & Analyzing Data from Transformer Differential Installations**  
Dave Costello, SEL, Inc.

**Technical Paper Session TP6  
RENEWABLE ENERGY**

**Chairman:** Randy Collins, Clemson University

**Location:** Ballroom C

- **Boost Converter for Solar Photo Voltaic Systems with Centralized Storage**  
Abhishek Khanna, Power Grid, India
- **An Approach Based on Particle Swarm Optimization for Distribution Feeder Reconfiguration Considering Distributed Generators**  
J. Olamei, Islamic Azad University
- **Mitigation of Subsynchronous Oscillations in a Series Compensated Wind Farm with (TSCS)**  
Rajiv K. Varma, Ysni Semesedini, Soubhik Auddy, Canada

6:30 – 7:00            Cash Bar

7:00 – 9:00            **Banquet**  
**Location:** Grand Ballroom  
**Keynote Speaker:** J. D. Hammerly, President, AREVA, North America  
**“Future Directions in Power Industry”**

**FRIDAY                    MARCH 16, 2007**

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

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

8:15 – 8.45            **Keynote Speech: “Green Power & Renewable Energy”**  
Terry Blackwell, Senior VP, Santee Cooper  
**Location:** Bellsouth Auditorium

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

**PANEL DISCUSSION PD5  
CYBER SECURITY**

**Chairman:** Jason Stamp, Sandia National Laboratory

**Location:** Ballroom A

**Panelists:**

- **DOE National SCADA Test Bed: Overview and Projects**  
Jason Stamp, Sandia National Laboratories
- **Differences Between General IT Business Policy and SCADA/Process Control Policy**  
Regie Bryant, Duke Energy
- **Security Considerations Associated with the Southern California Edison AMI Project**  
Erich Gunther, Enernex Corporation

12:00 – 1:30

**Lunch**

**Location:** Ballroom B

**Acknowledgement and Announcements:**

Adly Girgis, Clemson University

1:30 – 2:00

Distribution of Certificates and return of evaluation forms

2:00

Adjourn

**MARK YOUR CALENDAR PSC08 CONFERENCE: MARCH 11-14, 2008**