Power Systems 2012 Conference
Advanced Metering, Protection Control, Communication and Distributed Resources

March 13-16, 2012
Madren Center, Clemson University,
Clemson, SC, USA
PSC12 TECHNICAL PROGRAM

Tuesday, March 13, 2012

7:30 - Registration
Location: Terrace Hallway

8:00 – 12:00 Tutorials

Tutorial A: “Modern Protection Solutions”
Chairman: Roy Moxley, SEL
Location: Ballroom C
Date/Time: Tuesday 3/13/2012, 8:00 – 12:00

- Welcome, Company Update & Introduction to Distribution Network Automation
- Improve Safety With High-Impedance Fault Protection
- Distribution Feeder Fault Location System (DFLS)
- Automation Network Reconfiguration (ANR)
- Improving Distribution System Operation Using Synchrophasor Technology
- Improve Service Quality With Main-Tie-Main and Fast Motor Bus Transfer

Tutorial B: “Practical Examples of Deploying IEC61850 Projects Using IEDs From Multiple Vendors”
Chairman: Farel Becker & Dan Murray, Siemens
Location: Ballroom A
Date/Time: Tuesday 3/13/2012, 8:00 – 12:00

- Project workflow for deploying a 61850 system from design to test and commissioning
- Determining the communications architecture based on existing and future IEDs
- Tools and techniques for creating ICD, SCD and CID files, and testing the protection logic
- Defining user interface conventions and display prototyping
- Creating/importing HMI database and testing
- Tools and techniques for performing end-to-end system tests
- Gathering fault records from multiple vendor IEDs
- NERC CIP compliance and logging management
- Practical protection examples

Lunch will be served in Ballroom B
Golf Sponsored by GE Digital Energy starts at 1:30
Pre-registration for golf is required.

Reception Sponsored by Siemens: 6:00 – Dark
Location: Connector Patio (Area between Madren Inn and the Conference Center)
Wednesday, March 14, 2012

7:30 - Registration
   Location: Terrace Hallway

8:00 – 8:15 Welcoming and Introduction
   Elham B. Makram and Gerald Sonnenfeld, Clemson University
   Location: Bellsouth Auditorium

   Scott Henry, CEO of SERC
   Location: Bellsouth Auditorium

Wednesday, March 14, 2012  9:00 – 11:45

Panel Discussion, PD1
   “Smart Grid Topics”
   Chairman: Siri Varadan, DNV KEMA
   Location: Bellsouth Auditorium

Panelists:
   • Kerry Barnette, Duke Energy, focusing on Metering
   • Paul Hanson, AEP, focusing on Distribution
   • G. Kumar Venayagamoorthy, Clemson University, focusing on Transmission & PMU
   • Tom Myers, DNV KEMA, focusing on Asset Management

Wednesday, March 14, 2012  9:00 – 11:45

Technical Paper Session TP1
   “Modern Power System Protection Applications”
   Chairman: Mike Budreau, Santee Cooper
   Location: Ballroom A

   • “Verify Performance and Safety of Arc-Flash Detection Systems”
     Mark Zeller, SEL
   • “Automated Fault Location System for Nonhomogeneous Transmission Networks”
     Yanfeng Gong, Venkat Mynam, Armando Guzman, Gabriel Benmouyal, SEL, and Boris Shulim, Orange & Rockland (ORU)
   • “Capacitor Bank Protection for Simple and Complex Configurations”
     Roy Moxley, Jeff Pope, SEL
   • “Protecting Distribution Substation Assets – Modern Protection Schemes with Microprocessor-Based Relays”
     Larry Wright, SEL, Lee Ayers, Mid-Carolina Electric Cooperation, Mark Lanier, Atlantic Power Sales
   • “Protection Considerations for Power System Stability”
     Manish Patel, Southern Company
Wednesday, March 14, 2012 11:45 – 12:30

Exhibit Area Presentations

The following companies will be presenting exhibits in the Terrace Hallway.

<table>
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<th>Alstom</th>
<th>DNV KEMA</th>
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| 12:30 – 2:00 | Lunch  | Keynote Speech: “Rebirth of the Nuclear Industry”  
Terry Blackwell, Senior VP, Santee Cooper  
**Location:** Ballroom B |

2:00 – 5:00  
Technical Sessions

Wednesday, March 14, 2012 2:00 – 5:00

Panel Discussion, PD2  
“Plug-In Electric Vehicles”  
**Chairman:** G. Kumar Venayagamoorthy, Clemson University  
**Location:** Bellsouth Auditorium

Panelists:
- “Coordinating Strategy for Integrating Electric Vehicles and Distributed Generation at high penetrations”, Johan Enslin, University of North Carolina Charlotte
- “Smart Power Systems with Electric Vehicles - examples with a European perspective”, Lina Bertling Tjemberg, Chalmers University of Technology (Gothenberg)
- “The Market Status and Utility Preparations for Plug-In Vehicles”, Mike Rowand, Duke Energy

Wednesday, March 14, 2012 2:00 – 5:00

Technical Paper Session TP2  
“Power System Communication”  
**Chairman:** Terrence Smith, GE Digital Energy Multilin  
**Location:** Ballroom A

- “Merging SONET and Ethernet Communications for Power System Applications”  
  Ed Schweitzer, Dave Whitehead, Ken Fodero, Paul Robertson, Dennis Gammel, SEL
- “Radio Fundamentals and Applications”  
  Doug McNeill, GE Digital Energy Multilin
- “Fully Monitoring Protection and Control Systems”  
  Terrance Smith, Jacov Vic, Craig Wester, GE Digital Energy Multilin
- “All the Data Fit to Print – Applying All the Available Synchronphasor Information”  
  Roy Moxley, Bill Flerchinger, SEL
Wednesday, March 14, 2012 5:00 – 6:00

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Thursday, March 15, 2012

7:30 - Registration
Location: Terrace Hallway

8:00 – 8:15 Welcoming and Introduction
Elham B. Makram and G. Kumar Venayagamoorthy, Clemson University
Location: Bellsouth Auditorium

8:15 – 8:45 Keynote Speech: “Smart Grid Workforce Development - Advice for Educators, Utilities, Vendors, and Individuals”
Erich Gunther, Chairman and CTO, EnerNex
Location: Bellsouth Auditorium

9:00 – 11:45 Technical Sessions

Thursday, March 15, 2012  9:00 – 11:45

Panel Discussion, PD3
“Power System Protection Topics”
Chairman: Roy Moxley, SEL
Location: Bellsouth Auditorium

Panelists:
- Andre Smit, Siemens
- Craig Wester, GE Digital Energy Multilin
- Paul Robertson, SEL
Thursday, March 15, 2012

**Technical Paper Session TP3**  
**“Distributed Generation & Grid Considerations”**  
**Chairman:** Roger Munay, Siemens  
**Location:** Ballroom A

- “Real-Time Energy Dispatch Optimization of a Grid-Connected Micro-grid”  
  Zhao Zheng, Elham B. Makram, Clemson University
- “Energy Storage Control for Integration of Single-Phase Sources into a Three-Phase Micro-Grid”  
  Prajwal Gautam, Kumar Venayagamoorthy, Clemson University, & Keith Corzine, Missouri S&T
- “Fault Analysis In An Unbalanced Distribution System With Distributed Generation”  
  Parimal Saraf, Elham B. Makram, Clemson University
- “Protection Coordination of Directional Overcurrent Relays in the Presence of DG”  
  Hatem Zeineldin, Masdar Institute

**Thursday, March 15, 2012**  
9:00 – 11:45

**Tutorial C:**  
**“Harmonic Characterization of Wind Plants by Means of Power Quality Measurements”**  
**Chairman:** Grazia Todeschini and Gene Porter, EnerNex  
**Location:** Ballroom C

- Tutorial summary document available on conference website.  
- The tutorial will be accompanied by a technical paper authored by tutorial chairpersons.

**Thursday, March 15, 2012**  
11:45 – 12:30

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| 12:30 – 2:00 | **Lunch**  | **Keynote Speech:** “Smart Grid: Concepts, Standards, Deployments, and Lessons Learned.”  
  John McDonald,  
  Director of Technical Strategy and Policy Development, GE  
  **Location:** Ballroom B |
Thursday, March 15, 2012

2:00 – 5:00  Technical Sessions

Panel Discussion, PD4
“Wind Energy Integration”
Chairman: Chris Fallon, Duke Energy
Location: Bellsouth Auditorium

Panelists:
• John McIntosh, Savannah River National Laboratory
• John Daniel, ABB
• Grazia Todeschini, EnerNex
• Elham B. Makram, Clemson University

Technical Paper Session TP4
“Smart Grid Topics”
Chairman: Dal Poston, Duke Energy
Location: Ballroom A

• “Advanced Distribution Reclosing Using Wireless Communications”
  Timothy Fahey, GE Digital Energy Multilin
• “Practical Applications of Peer-to-Peer Messaging in Industrial Facilities”
  Craig Wester, GE Digital Energy Multilin
• ”New Implementation of Adaptive Protection on Automated Distribution Feeders”
  Andre Smit, Ernest Creech, Alexandr Stinskiy, and Kelvin Petit, Siemens
• “Parallelization of Cellular Neural Networks for Smart Grid Applications”
  Bipul Luitel, Kumar Venayagamoorthy, Clemson University

Thursday, March 15, 2012 5:00 – 6:00

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6:00 – 6:30   Keynote Speech:
Introductory remarks by Dr. Larry Dooley, Clemson University
"Engineers as Leaders…..and Followers"
Russ Campbell, VP of Power Delivery Engineeirng, Duke Energy
Location: Ballroom B

6:30 – 7:00  Cash Bar
7:00 – 8:00  Dinner Banquet and Entertainment
Friday, March 16, 2012

8:00 – 8:15  **Welcoming and Introduction**
Elham B. Makram and Kumar Venayagamoorthy, Clemson University
**Location:** Bellsouth Auditorium

8:15 – 8:45  **Keynote Speech:** “AMI, DA, and the Smart Grid”
David Hart, VP, Elster Electricity

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

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**Friday, March 16, 2012  9:00 – 12:00**

**Technical Paper Session TP5**
“Wide-Area Monitoring, Control & Operations”
**Chairman:** Durgesh Manjure, Midwest ISO
**Location:** BellSouth Auditorium

- “Time Domain Rotor Angle Deviation Estimation for Real Time Transient Stability Assessment in Wide Area Power System”
  Zhenhua Wang, Elham B. Makram, Clemson University
- “A Preliminary Study of Offshore Wind Farm Switching Transient Impact on Power System”
  Tingting Wang, Elham B. Makram, Clemson University
- “Adaptive Out-of-Step Protection Techniques for Wide Area Disturbances”
  Tom Baldwin and M. A. Danku, Florida State University

9:00 – 3:30  **All-Day Tutorial**

**Tutorial D:** “Basics of Smart Grid and Renewable Energy Resources”
**Chairman:** Steve Blume, *Applied Professional Training*
**Location:** Teleconference Room
**Date/Time:** Friday 3/16/2012, 9:00 – 15:30
With lunch break

- Brief Introduction
- Distributed Generation, Microgrids, Transportation Electrification
- Smart Buildings, Load Management, and Smart Homes

12:00 – 2:00  **Lunch**
**Location:** Seasons By The Lake

8:00 – 15:30  **Distribution of Certificates of CEUs** in Terrace Hallway