

# 2012

JANUARY 16-20  
Washington, D.C.

# TSGT

**IEEE PES  
Innovative Smart Grid Technologies Conference**



**Washington Marriott  
Wardman Park Hotel**

**IEEE  
SMARTGRID**

# 2012

# ISGI

IEEE PES

Innovative Smart Grid Technologies Conference

**CONFERENCE ORGANIZING COMMITTEE:**

*Conference Chair:* Mohammad Shahidehpour, Illinois Institute of Technology (ms@iit.edu)

*Technical Program Chair:* Jianhui Wang, Argonne National Laboratory (jianhui.wang@anl.gov)

*Conference Treasurer:* Steve Pullins, Horizon Energy Group (Spullins@horizonenergygroup.com)

*Conference Publicity Chair:* Julio Romero Agüero, Quanta Technology (julio@quanta-technology.com)

**CONFERENCE TECHNICAL COMMITTEE:**

Wanda Reder, S&C Electric

Jay Giri, Alstom

Steve Pullins, Horizon Energy

Thomas Kerestes, West Monroe Partners

Khosrow Moslehi, ABB

Paul McCoy, McCoy Energy

Sioe Mack, Distribution Control Systems

Lorenzo Peretto, Università di Bologna

Alberto.Borghetti, Università di Bologna

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S. S. (Mani) Venkata, Alstom

Farhad Ashrafzadeh, Whirlpool

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Paul Myrda, EPRI

Farrokh Rahimi, OATI

Chen-Ching Liu, University College Dublin

Lina Bertling, Chalmers University

Mladen Kezunovic, Texas A&M University

John Kelly, Galvin Electricity Initiative

Bruce Hamilton, Adica

Luiz Augusto Barroso, PSR

Abas Goodarzi, US Hybrid

Mark McGranaghan, EPRI

Thomas Overbye, University of Illinois

Melissa Gordon, Operations Green Job

Andrew Barbeau, Illinois Institute of Technology

Steve Blume, Applied Professional Training

Aty Edris, Quanta Technology

Zareh Soghomonian, QinetiQ North America

**IEEE POWER & ENERGY SOCIETY ORGANIZER:**

D'Nese Moore

**CONFERENCE MANAGEMENT:**

Bullseye International Group Inc.



# MONDAY

## Monday Morning Tutorial Sessions

16 January, 8:30 AM – 12:00 PM

Madison A

### TUTORIAL 1: Emerging Challenges and Opportunities for Power System Operation and Trading under Smart Grid

#### Instructors:

Dr. Farrokh Rahimi and Dr. Ali Ipakchi (Open Access Technology International, Inc.)

**Summary:** The tutorial starts with an overview of regulatory, operational, and business drivers shaping the future of the electric power industry and energy markets. It then addresses the challenges of power system operations under high penetration of variable generation on one hand, and emerging mitigation opportunities provided by demand-side resources on the other. Finally, it addresses values that can be created through full integration of demand-side and distributed resources, and discusses opportunities for new market products and services, trading and scheduling requirements, and associated benefits and risks. These are illustrated through examples and case studies.

#### Topics

- Regulatory and Business Drivers and Framework
- Use of Demand-Side Resources to address System Operational Issues
- Demand Response Opportunities in ISO/RTO Markets
- Benefit Assessment
- Concluding Remarks and Q/A

16 January, 1:00 PM – 5:00 PM

Madison A

### TUTORIAL 2: Smart Substation Technologies and Applications

#### Instructors:

J.C. TAN and K. J. Svensen, Mott MacDonald, Inc.

**Summary:** This four-hour tutorial is an introduction on state-of-the-art smart substation technologies and their applications in new and retrofitting substations. Two international projects will be given to demonstrate how Smart Substation technologies are integrated into substation specification, design, construction and commission testing before energization.

#### Topics

- Overview of Substation Design
- Merging Technology
- Application Examples/International Projects

## Monday Tutorial Sessions

16 January, 08:30 AM – 05:00 PM

Madison B

### TUTORIAL: Advanced DA/DMS Applications in Smart Grid

#### Instructors:

Dr. Jiyuan Fan & John D. McDonald, GE Energy

**Summary:** This course introduces the intuitive concepts, fundamental theories, practical technologies, core functionalities and real use cases of the advanced Distribution Automation & Management (DA/DMS) applications in Smart Grid. The potential audiences would include the power system planning/operation engineers, project/product managers, business leaders in power utilities, smart grid solution providers, system developers, as well as other institutes and individuals working on or interested in the Smart Grid solutions. The course will cover the following break-down topics on DA/DMS: Overall Framework and Architecture of DA/DMS Systems in Smart Grid, Distribution System

Operation Models and Advanced Applications for Distribution System Operation, Analysis and

Optimization, DER Management and Optimization, Consumer Participation and the Impacts to the

Distribution System Operation, DMS system integration with other systems in Smart Grid.

#### Topics

- Introduction of Distribution Automation & Management Systems
- Distribution System Models in DA/DMS
- Advanced Applications in DA/DMS
- Chapter 4. Future Developments
- Chapter 5. General Discussion

## Monday Evening Reception

16 January, 05:00 PM – 07:00 PM

Thurgood Marshall Ballroom

### Pre-Conference Networking and Reception

# TUESDAY

## Tuesday Morning Technical Sessions

17 January, 07:30 AM – 08:15 AM

Thurgood Marshall Ballroom Foyer

Conference Registration and Continental Breakfast

### WELCOME REMARKS

17 January, 08:15 AM – 08:30 AM

Thurgood Marshall Ballroom

Mohammad Shahidehpour, Chair, 2012 ISGT Conference

Noel Schulz, President, IEEE PES

### KEYNOTE SESSION

17 January, 08:30 AM – 09:00 AM

Chair:

**Noel Schulz**, President, IEEE Power and Energy Society

Speaker:

**Bill Gausman**, Senior Vice President of Asset Management and Planning, Pepco Holdings

### PLENARY SESSION

#### Smart Grids: How to Unleash Smart Grid Investment and Innovation *(plenary session)*

17 January, 09:00 AM – 10:00 AM

Chair:

**John Kelly**, Executive Director, Galvin Electricity Initiative

Panelists:

**12SG0077, Accelerating Innovation and Investment in Grid Performance**

**Bill Gausman**, Senior Vice President, PEPCO

**Don Snyder**, Director of Standards, UL's U.S. Operations

**Wanda Reder**, Vice President of Power Systems, S&C Electric Company

**Jeff Katz**, Chief Technology Officer, Energy and Utilities Industry, IBM

### TUESDAY MORNING SNACK BREAK

17 January, 10:00 AM – 10:30

Thurgood Marshall Ballroom Foyer

### Smart Grid Project Implementation Experiences *(panel session)*

17 January, 10:30 AM – 12:00 PM

Thurgood Marshall North

Chair: **Jay Giri**, Alstom

Panelists:

**Andy Ott**, PJM Interconnection

**Damir Novosel**, Quanta Technology (12SG0136, *Experiences with Deployment of Smart Grid Projects*)

**Carl Imhoff**, Pacific Northwest National Laboratory

**Vahid Madani**, Pacific Gas & Electric

**Tim Figura**, Pennsylvania Power and Light

### Applications of Smart Grid Technologies on Power Distribution Systems *(panel session)*

17 January, 10:30 AM – 12:00 PM

Thurgood Marshall West

Chair: **Julio Romero Agüero**, Quanta Technology

Panelists:

**Julio Romero Agüero**, Quanta Technology (12SG0038, *Applications of Smart Grid Technologies on Power Distribution Systems*)

**Thomas Bialek**, San Diego Gas and Electric

**Bartosz Wojszczyk**, GE (12SG0050, *Deployment of Advanced Smart Grid Solutions – Global Examples & Lessons Learned*)

**Bob Uluski**, EPRI (12SG0067, *Advanced Applications for Distribution System Optimization*)

**Josh DiLuciano**, Avista (12SG0059, *Avista's Smart Grid Deployment*)

**Johan Enslin**, Petra Solar (12SG0064, *Advanced Controls for Photovoltaic Inverters*)

### Microgrid Applications: Research, Testing, and Deployment *(panel session)*

17 January, 10:30 AM – 12:00 PM

Thurgood Marshall South

Chair: **Merrill Smith**, U.S. Department of Energy

Panelists:

**Dan Ton**, U.S. Department of Energy (12SG0235, *Key Findings from the U.S. Department of Energy 2011 Microgrid Workshop*)

**Jason Stamp**, Sandia National Laboratory (12SG00352, *The SPIDERS Project — Smart Power Infrastructure Demonstration for Energy Reliability and Security for US Military Facilities*)

**Michael Stadler**, Lawrence Berkeley National Laboratory (12SG0361, *Web-Based Economic and Environmental Optimization of Microgrids*)

**Ben Kroposki**, National Renewable Energy Laboratory (12SG0416, *Microgrid Testing*)

## **Communications for Smart Grid** *(paper session)*

**17 January, 10:30 AM – 12:00 PM**

### **Thurgood Marshall East**

Session Chair: **Hui Ni**, Accenture

### **2012ISGT0333, Secure Wireless Data Communications for Distribution Automation in the Smart Grid**

C. Goldman, Freeware Technologies  
C. Lippincott, Freeware Technologies

### **2012ISGT0269, A Secure and Privacy-Preserving Communication Scheme for Advanced Metering Infrastructure**

P. Deng, Colorado State University  
L. Yang, Colorado State University

### **2012ISGT0264, High-Speed Communication-Assisted Tripping and Sectionalizing for Distribution Systems**

S. Turner, Beckwith Electric Co.

### **2012ISGT0251, Communication Technologies for BCIT Smart Microgrid**

G. Stanciulescu, BC Hydro, Canada  
H. Farhangi, BCIT, Canada  
A. Palizban, BCIT, Canada  
N. Stanchev, BCIT, Canada

### **2012ISGT0051, Security Hub Architecture Support for IEC61850 Information Exchange Protocols**

S. Aggarwal, Indian Institute of Technology, Guwahati

## **Advanced Metering Infrastructure** *(paper session)*

**17 January, 10:30 AM – 12:00 PM**

### **Madison A**

Session Chair: **Chris Thomas**, Institute for Sustainable Energy Development, USA

### **2012ISGT0385, A Fuzzy Markov Model for Scalable Reliability Analysis of Advanced Metering Infrastructure**

S. A. Zonouz, University of Illinois at Urbana Champaign  
R. Berthier, University of Illinois at Urbana Champaign  
P. Haghani, University of Illinois at Urbana Champaign

### **2012ISGT0172, Synchronizing SCADA and Smart Meters Operation for Advanced Smart Distribution Grid Applications**

S. T. Mak, ESTA International, USA  
N. Farah, ESTA International, USA

### **2012ISGT0432, WISEMEN: White SpacE for smart MEteriNg**

S. Subramani, Telecommunication Research Laboratory, Toshiba Research Europe  
Z. Fan, Telecommunication Research Laboratory, Toshiba Research Europe  
S. Gormus, Telecommunication Research Laboratory, Toshiba Research Europe  
P. Kulkarni, Telecommunication Research Laboratory, Toshiba Research Europe  
M. Sooriyabandara, Telecommunication Research Laboratory, Toshiba Research Europe

### **2012ISGT0346, Economic Analysis of Privacy-Aware Advanced Metering Infrastructure Adoption**

D. P. Ghosh, Cornell University  
D. E. Schrader, Cornell University  
W. D. Schulze, Cornell University  
S. B. Wicker, Cornell University

### **2012ISGT0273, Comparison of Data Forwarding Mechanisms for AMI Networks**

S. Cespedes, University of Waterloo, Canada  
A. A. Cardenas, Fujitsu Laboratories of America  
T. Iwao, Smart Network Division

## **Electrification of Transportation** *(paper session)*

**17 January, 10:30 AM – 12:00 PM**

### **Madison B**

Session Chair: **Abas Goodarzi**, US Hybrid Corporation

### **2012ISGT0444, Fleet Electrification: A Step toward the Ultimate Microgrid?**

Timothy J. McCoy, U.S. Navy  
J. M. Voth, Herren Associates  
D. E. Anderson, Herren Associates

### **2012ISGT0253, Security Concerns of a Plug-In Vehicle**

H. Chaudhry, Argonne National Laboratory  
T. Bohn, Argonne National Laboratory

### **2012ISGT0382, Power Management Strategies for Hybrid Electric Trucks in Smart-Grids**

P. Khayyer, Ohio State University  
A. Izadian, Purdue School of Engineering and Technology

### **2012ISGT0192, Measurement and Analysis of Consumption Energy for Korean High-speed Trains**

T. Lee, Korea Railroad Research Institute  
H. Cho, Korea Railroad Research Institute  
S. Kim, Korea Railroad Research Institute  
K. Kim, Korea Railroad Research Institute

### **2012ISGT0376, A Novel Approach to Feed Electric Bus on Traction**

N. Parimi, University of Missouri  
S. Ramineni, University of Missouri

## Tuesday Afternoon Technical Sessions

### Smart Grid Integration of Distributed Energy Resources, Demand Response, Electric Vehicles, and Energy Storage

(panel session)

17 January, 01:00 PM – 02:30 PM

Thurgood Marshall North

Chair: **Paul Wang**, Energy & Environmental Resources Group, LLC (E2RG)

Panelists:

**Tom King**, Oak Ridge National Laboratory (12SG0293, Advancements that will Facilitate the Integration of Smart Grid Technologies)

**Thomas Bialek**, San Diego Gas and Electric (12SG0168, SDG&E's Perspective on Smart Grid Integration of Renewables)

**Mustafa Biviji**, E2RG (12SG0295, Price Elasticity of Electricity Demand for Various Dynamic Rate Programs)

**Yilu Liu**, University of Tennessee (12SG0040, Monitoring Power System Disturbances Based on Distribution-level Phasor Measurements)

### Cyber-Physical System Security in a Smart Grid Environment

(panel session)

17 January, 01:00 PM – 02:30 PM

Thurgood Marshall West

Chair: **Chen-Ching Liu**, Washington State University

Panelists:

**Jeff Dagle**, Pacific Northwest National Laboratory (12SG0146, Cyber-Physical System Security of Smart Grids)

**Goran Andersson**, ETH, Switzerland (12SG0049, Cyber-Security of SCADA Systems)

**Manimaran Govindarasu**, Iowa State University (12SG0078, Cyber Attack-resilient Control for Smart Grid)

**Kumar Venayagamoorthy**, Missouri University of Science and Technology

**Chen-Ching Liu and Alexnadru Stefanov**, University College Dublin, Ireland (12SG0071, Cyber-Power System Security in a Smart Grid Environment)

### Control and Monitoring of Smart Grid

(paper session)

17 January, 01:00 PM – 02:30 PM

Thurgood Marshall South

Session Chair: **Xiaoming Feng**, ABB

### 2012ISGT0384, Simulation Models for Evaluation of Network Design and Hierarchical Transactive Control Mechanisms in Smart Grids

D. Jin, University of Illinois at Urbana-Champaign

X. Zhang, IBM Research Division

S. Ghosh, IBM Research Division

### 2012ISGT0397, A New Automatic Generation Control with Heterogeneous Assets for Integration of Renewables

A. Keyhani, The Ohio State University

A. M. Annaswamy, Massachusetts Institute of Technology

### 2012ISGT0426, A New Monitoring Architecture for Distribution Feeder Health Monitoring, Asset Management, and Real-Time Situational Awareness

J. A. Wischkaemper, Texas A&M University

C. L. Benner, Texas A&M University

B. D. Russell, Texas A&M University

### 2012ISGT0328, Identification of Aged Cable Section in 12.5 kV URD System using EMTP Simulation

B. Pushpanathan, Mississippi State University

S. Grzybowski, Mississippi State University

T. O. Bialek, Mississippi State University

### 2012ISGT0156, A Novel Charging-Time Control Method for Numerous EVs based on a Period Weighted Prescheduling for Power Supply and Demand Balancing

H. Yano, NEC Corporation, Japan

K. Kudo, NEC Corporation, Japan

T. Ikegami, University of Tokyo, Japan

H. Iguchi, NEC Corporation, Japan

K. Kataoka, University of Tokyo, Japan

K. Ogimoto, University of Tokyo, Japan

### 2012ISGT0422, Control Method for Multi-Microgrid Systems in Smart Grid Environment—Stability, Optimization and Smart Demand participation

M. A. Sofla, University of Toledo, USA

R. King, University of Toledo, USA

### Smart Grid Demonstrations (paper session)

17 January, 01:00 PM – 02:30 PM

Thurgood Marshall East

Session Chair: **Kai Xie**, SGCC China

### 2012ISGT0239, PJM Advanced Technology Pilots for System Frequency Control

H. Ni, PJM Interconnection LLC

### 2012ISGT0124, PNM Smart Grid Demonstration Project from Modeling to Demonstration

S. Abdollahy, University of New Mexico

O. Lavrova, University of New Mexico

A. Mammoli, University of New Mexico

S. Willard, University of New Mexico

B. Arellano, University of New Mexico

### 2012ISGT0147, Smarter Micro Grid for Energy Solution to Rural Ethiopia

T. T. Erbat, TU-Darmstadt, Germany

T. Hartkopf, TU-Darmstadt, Germany

**2012ISGT0329, Regulatory Impact Analysis of Smart Meters Implementation in Brazil**

D. R. V. Leite, Superintendence of Distribution Services Regulation, Brazil  
H. Lamin, Superintendence of Distribution Services Regulation, Brazil  
J. M. C. de Albuquerque, Superintendence of Distribution Services Regulation, Brazil  
I. M. T. Camargo, Superintendence of Distribution Services Regulation, Brazil

**2012ISGT0410, Development and Implementation of Renewable Energies in Colombia as part of the National Political Agenda: a Review of Regulations and Incentives**

D. Ortiz, U. Militar Nueva Granada, Colombia  
M. Gualteros, Universidad Nacional, Colombia  
S. Sanabria, Universidad Nacional, Colombia  
J. Sabogal, Universidad Militar, Colombia

**2012ISGT0188, Kentucky Smart Grid Roadmap Initiative**

Y. Du, University of Kentucky  
Y. Liao, University of Kentucky  
M. Turner, University of Louisville  
M. Sunkara, University of Louisville  
J. DeRouen, Kentucky Public Service Commission  
A. Greenwell, Kentucky Public Service Commission  
J. Rogness, Kentucky Public Service Commission  
K. Cole, Kentucky Public Service Commission  
J. Gardner, Kentucky Public Service Commission

**Demand Response and Real-Time Pricing**

*(paper session)*

**17 January, 01:00 PM – 02:30 PM**

**Madison A**

Session Chair: **Mark Petri**, Argonne National Laboratory

**2012ISGT0255, The Industry Demands Better Demand Response**

M. Zimmerman, Building IQ

**2012ISGT0300, New Energy Concepts and Related Information Technologies: Dual Demand Side Management**

A. Monti, E.ON Energy Research Center, RWTH Aachen, Germany  
F. Ponci, E.ON Energy Research Center, RWTH Aachen, Germany  
D. Müller, E.ON Energy Research Center, RWTH Aachen, Germany  
R. Strebblow, E.ON Energy Research Center, RWTH Aachen, Germany  
D. Cali, E.ON Energy Research Center, RWTH Aachen, Germany

**2012ISGT0138, Demand Response Control for PHEV Charging Stations by Dynamic Price Adjustments**

D. Ban, North Carolina State University  
G. Michailidis, North Carolina State University  
M. Devetsikiotis, University of Michigan

**2012ISGT0157, Diverse Demand Side Portfolio: Another Step towards Smart Grids**

S. S. Mohtavipour, Tarbiat Modares University  
G. R. Yousefi, Isfahan University of Technology  
F. Fallahi, Niroo Research Institute

**2012ISGT0135, Demand Responsive Bidding Strategy of a Buyer in Uniform Price Electricity Market**

A.K. Jain, Indian Institute of Technology, Kanpur, India  
S.C. Srivastava, Indian Institute of Technology, Kanpur, India  
S.N. Singh, Indian Institute of Technology, Kanpur, India  
L. Srivastava, Majhighariani Institute of Technology & Science, India

**2012ISGT0303, Lighting Systems Control for Demand Response**

S. Husen, Philips Research, Eindhoven, Netherlands  
A. Pandharipande, Philips Research, Eindhoven, Netherlands  
L. Tolhuizen, Philips Research, Eindhoven, Netherlands  
Y. Wang, Philips Research, Eindhoven, Netherlands  
M. Zhao, Philips Research, Eindhoven, Netherlands

**Microgrid Operation and Control** *(paper session)*

**17 January, 01:00 PM – 02:30 PM**

**Madison B**

Session Chair: **Guang Li**, ERCOT

**2012ISGT0127, Growing the Business without Increasing the Electrical Supply Capacity: A Smart Microgrid Approach**

J. J. van der Merwe, Energy Cybernetics, South Africa  
L. J. Grobler, NorthWest University, South Africa

**2012ISGT0454, Soft Synchronization of Dispersed Generators to Micro Grids for Smart Grid Applications**

A. Mazloomzadeh, Florida International University  
V. Salehi, Florida International University  
O. Mohammed, Florida International University

**2012ISGT0233, Optimal Energy Management of a Rural Microgrid System Using Multi-objective Optimization**

X. Zhang, Arizona State University  
R. Sharma, NEC Laboratories America  
Y. He, Iowa State University

**2012ISGT0340, Sustainable Energy Microsystem (SEM): Preliminary Energy Analysis**

M. Brenna, Department of Energy, Politecnico di Milano, Italy  
M.C. Falvo, Department of Energy, Politecnico di Milano, Italy  
F. Foidelli, Sapienza University of Rome, Italy  
L. Martirano, Sapienza University of Rome, Italy  
D. Poli, University of Pisa, Italy

**2012ISGT0353, Managing Intermittent Renewables in a Microgrid**

Q. Fu, University of Wisconsin-Milwaukee  
A. Solanki, University of Wisconsin-Milwaukee  
L. F. Montoya, University of Wisconsin-Milwaukee  
A. Nasiri, University of Wisconsin-Milwaukee  
D. Yu, University of Wisconsin-Milwaukee  
V. Bhavaraju, Innovation Center, Eaton Corporation

## TUESDAY AFTERNOON SNACK BREAK

17 January, 02:30 PM – 03:00 PM

Thurgood Marshall Ballroom Foyer

### State of the art in the Synchrophasor Technology Research and Application

(panel session)

17 January, 03:00 PM – 05:00 PM

Thurgood Marshall North

Chair: **Mladen Kezunovic**, Texas A&M University

Panelists:

**Mladen Kezunovic**, Texas A&M University (12SG0079, Verifying Interoperability and Application Performance of PMUs and PMU-enabled IEDs at the Device and System Level)

**Ali Abur**, Northeastern University (12SG0069, Synchrophasor Assisted State Estimation: SPASE)

**Mani Venkatasubramanian**, Washington State University (12SG0061, Multi-dimensional Wavelet Analysis for Power System Oscillation Monitoring using Synchrophasors)

**Ritchie Carroll**, Grid Protection Alliance (12SG0399, Open Source Software for Synchrophasor Applications)

**Yilu Liu**, University of Tennessee (12SG0053, Wide-Area Dynamic Model Validation Using FNET Measurements)

### International Smart Grid Collaboration

(panel session)

17 January, 03:00 PM – 05:00 PM

Thurgood Marshall West

Chair: **Bruce Hamilton**, Adica, USA

Panelists:

**Tae-II Choi**, KEPCO, South Korea (12SG0140, International Business Offering Related to Innovative Smart Technologies)

**Chris Thomas**, Institute for Sustainable Energy Development, USA (12SG0213, Collaboration between South Korea and the State of Illinois)

**Kai Xie**, SGCC China (12SG0166, Sino-Singapore Tianjin Eco-City, Smart Grid, Smart City)

**Dae Kyeong Kim**, KATS/KERI, South Korea (12SG0142, Local Area Monitoring System for Microgrid project - KERI-IIT Collaboration Goals)

**Luiz A. Barroso**, PSR, Brazil

### Renewable Energy and Distributed Power Systems (paper session)

17 January, 03:00 PM – 05:00 PM

Thurgood Marshall South

Session Chair: **Nivad Navid**, Midwest ISO

#### 2012ISGT0392, Smart Grid Volt/Var Management: Challenges of Integrating Distribution DG

E. Tom Jauch, Beckwith Electric Company

#### 2012ISGT0366, Technical and Economic Impacts of Distributed Generation on the Transmission Networks

C. Táutiva, Universidad de los Andes, Colombia

H. Duran, Universidad de los Andes, Colombia

A. Cadena, Universidad de los Andes, Colombia

#### 2012ISGT0225, Grid Integration of Renewable Sources in the Distribution Networks: An Analysis Through ATP-EMTP

F. A. M. Moura, Universidade Federal do Triângulo Mineiro, Brazil

J. R. Camacho, Universidade Federal de Uberlândia, Brazil

M. L. R. Chaves, Universidade Federal de Uberlândia, Brazil

G. C. Guimarães, Universidade Federal de Uberlândia, Brazil

#### 2012ISGT0158, Maximum Power Extraction of Tidal Streams

M. J. Jahromi, Nanyang Technological University, Singapore

A. I. Maswood, Nanyang Technological University, Singapore

K.J. Tseng, Nanyang Technological University, Singapore

B. Bhangu, Rolls Royce, Singapore

N. H. Tehrani, Nanyang Technological University, Singapore

#### 2012ISGT0435, A Comparative Study of MPPT Methods for Distributed Photovoltaic Generation

A. Barchowsky, University of Pittsburgh

J. Parvin, University of Pittsburgh

G. Reed, University of Pittsburgh

M. Korytowski, University of Pittsburgh

B. Grainger, University of Pittsburgh

#### 2012ISGT0471, Comparison between High and Low Capacity in the Optimal Location of Distributed Generation with Uncertain Data

H. Goodarzi, Islamic Azad University, Iran

M. R. Haghifam, Tarbiat Modares University, Iran

### Vehicle-to-Grid Technology in Smart Grid

(paper session)

17 January, 03:00 PM – 05:00 PM

Thurgood Marshall East

Session Chair: **Thomas Bialek**, SDG&E

#### 2012ISGT0236, Economic Analysis of Vehicle-to-Grid (V2G)-Enabled Fleets Participating in the Regulation Service Market

A. D. Los Rios, Massachusetts Institute of Technology

J. Goentzel, Massachusetts Institute of Technology

K. E. Nordstrom, Massachusetts Institute of Technology

C. W. Siebert, XL Hybrids

#### 2012ISGT0386, Combined Bidding of Regulation and Spinning Reserves for Unidirectional Vehicle-to-Grid

E. Sortomme, Alstom Grid

#### 2012ISGT0178, Integration of Electric Vehicles in Smart Homes – An ICT-based Solution for V2G Scenarios

M. Mültin, Karlsruhe Institute of Technology, Germany

F. Allering, Karlsruhe Institute of Technology, Germany

H. Schmeck, Karlsruhe Institute of Technology, Germany



**2012ISGT0212, A Detailed Analysis of the Effective-Load-Carrying-Capacity Behavior of Plug-in Electric Vehicles in the Power Grid**

S. V. Chakraborty, Virginia Tech  
S. K. Shukla, Virginia Tech  
J. Thorp, Virginia Tech

**2012ISGT0318, Economic Assessment on V2G Frequency Regulation Regarding the Battery Degradation**

S. Han, University of Tokyo, Japan  
K. Sezaki, University of Tokyo, Japan  
S. Han, Konkuk University, Korea

**Storage Devices with Applications to Smart Grid** *(paper session)*

**17 January, 03:00 PM – 05:00 PM**

**Madison A**

Session Chair: **Aty Edris**, Quanta Technology

**2012ISGT0323, Optimal Storage Sizing for Integrating Wind and Load Forecast Uncertainties**

S. Dutta, NEC Laboratories America and University of Illinois, Urbana Champaign  
R. Sharma, NEC Laboratories America

**2012ISGT0203, System Constraints Effects on Optimal Dispatch Schedule for Battery Storage Systems**

J. Hill, Drexel University  
C. Nwankpa, Drexel University

**2012ISGT0389, Optimal Sizing of Smart Grid Storage Management System in a Microgrid**

S. Bahramirad, S&C Electric Company  
H. Daneshi, Southern California Edison

**2012ISGT0181, Smart Grid Applications of Selected Energy Storage Technologies**

S. O. Geurin, University of Arkansas  
K. Barnes, University of Arkansas  
J. C. Balda, University of Arkansas

**2012ISGT0186, A New Battery Energy Storage System Control Method Based on SOC and Variable Filter Time Constant**

L. Guo, Tianjin University, China  
Y. Zhang, Tianjin University, China  
C. S. Wang, Tianjin University, China

**2012ISGT0387, Battery Energy Storage and Wind Energy Integrated into the Smart Grid**

Matthew Clayton Such, Xtreme Power Systems, USA  
Cody Hill, University of Texas, Austin, USA

**Microgrid Technology in Power Systems**

*(paper session)*

**17 January, 03:00 PM – 05:00 PM**

**Madison B**

Session Chair: **Jason Stamp**, Sandia National Laboratory

**2012ISGT0350, Generation Capacity Design for a Microgrid for Measurable Power Quality Indexes**

Q. Fu, University of Wisconsin-Milwaukee  
A. Solanki, University of Wisconsin-Milwaukee  
L. F. Montoya, University of Wisconsin-Milwaukee  
A. Nasiri, University of Wisconsin-Milwaukee  
V. Bhavaraju, Innovation Center, Eaton Corporation  
D. Yu, University of Wisconsin-Milwaukee

**2012ISGT0357, Economic Dispatch for a Microgrid Considering Renewable Energy Cost Functions**

N. Augustine, Polytechnic Institute of New York University  
P. Moghe, Polytechnic Institute of New York University  
K. Sheikh, Polytechnic Institute of New York University  
S. Suresh, Corporate Research, Siemens

**2012ISGT0393, Improvement of Micro Grid Dynamics Using Micro Grid Frequency Controller**

M. A. Tabrizi, Tennessee Technological University  
G. Radman, Tennessee Technological University

**2012ISGT0308, A Framework for Real-Time Power Management of a Grid-Tied Microgrid to Extend Battery Lifetime and Reduce Cost of Energy**

S.A. Pourmousavi, Montana State University  
R. K. Sharma, NEC Laboratories America  
B. Asghari, NEC Laboratories America

**2012ISGT0204, Microgrid Operator's Capacity and Storage Investment Strategies under Environmental Regulations**

Y. He, Iowa State University  
R. Sharma, NEC Lab America  
X. Zhang, Arizona State University

**2012ISGT0442, Development of a Series Fault Model for DC Microgrids**

F. M. Uriarte, University of Texas at Austin  
H. B. Estes, University of Texas at Austin  
T.J. Hotz, University of Texas at Austin  
A. L. Gattozzi, University of Texas at Austin  
J. D. Herbst, University of Texas at Austin  
A. Kwasinski, University of Texas at Austin  
R. E. Hebner, University of Texas at Austin

## Tuesday Evening Poster Session and Reception

17 January, 06:00 PM – 08:00 PM

Thurgood Marshall Ballroom

### Poster Paper Presentation

Session Chair: **Jianhui Wang**, Argonne National Laboratory

#### **2012ISGT0242, Controlling the Heating Mode of Heat Pumps with the TRIANA Three Step Methodology**

H.A. Toersche, University of Twente, Netherlands  
V. Bakker, University of Twente, Netherlands  
A. Molderink, University of Twente, Netherlands  
S. Nykamp, University of Twente, Netherlands  
J. L. Hurink, University of Twente, Netherlands  
G. J. M. Smit, University of Twente, Netherlands

#### **2012ISGT0316, Noise Modeling and OFDM Based Receiver Design in Power-Line Communication**

T. Guzel, Tubitak-Uekae, Turkey  
E. Ustunel, Tubitak-Uekae, Turkey  
H. B. Celebi, Tubitak-Uekae, Turkey  
M. K. Mihcak, Bogazici University, Turkey

#### **2012ISGT0377, Multi-objective Quantum-Inspired Evolutionary Programming for Optimal Location and Sizing of Distributed Generation**

Z. M. Yasin, Universiti Teknologi Mara, Malaysia  
T.K. Abdul Rahman, Universiti Teknologi Mara, Malaysia  
Z. Zakaria, Universiti Teknologi Mara, Malaysia

#### **2012ISGT0276, Smart Grid for Offshore Wind Farms: Towards an Information Model based on the IEC 61400-25 Standard**

T. H. Nguyen, University of Agder, Norway  
A. Prinz, University of Agder, Norway  
T. Friiso, Origo Solutions AS, Norway  
R. Nossun, University of Agder, Norway  
H. Delic, Bogazici University, Turkey

#### **2012ISGT0321, Energy Storage in Future Smart Grid**

J. Shah, K K Wagh Institute of Engineering Education and Research, India  
T. Wadghule, K K Wagh Institute of Engineering Education and Research, India  
N. Yadav, K K Wagh Institute of Engineering Education and Research, India  
N. Singh, K K Wagh Institute of Engineering Education and Research, India

#### **2012ISGT0372, Solar Radiation Prediction Based on Recurrent Neural Networks Trained By Levenberg-Marquardt Back propagation Learning Algorithm**

N. Zhang, University of the District of Columbia  
P. K. Behera, University of the District of Columbia

#### **2012ISGT0297, A Novel Fuzzy-Logic-Control for a Z-Source Inverter as a Transformer-Less Grid-Connected Photovoltaic Power Conditioner**

A. Bahmanabadi, Farahani Engineering Company, Iran  
K. Abbaszadeh, K.N.Toosi University of Technology, Iran  
J. Olamaei, Islamic Azad University, Iran

#### **2012ISGT0032, Tidal In-Stream Generation with Improved PCC Voltage Profile**

M. J. Jahromi, Nanyang Technological University, Singapore  
A. I. Maswood, Nanyang Technological University, Singapore  
K.J. Tseng, Nanyang Technological University, Singapore  
B. Bhangu, Rolls Royce Singapore, Singapore

#### **2012ISGT0423, Optimal Placement of Branch PMUs in the Indian Smart Grid**

M. Rihan, Aligarh Muslim University, India  
M. Ahmad, Aligarh Muslim University, India  
M. S. Beg, Aligarh Muslim University, India

#### **2012ISGT0326, Analysis of Battery Storage Utilization for Load Shifting and Peak Smoothing on a Distribution Feeder in New Mexico**

O. Lavrova, University of New Mexico  
F. Cheng, University of New Mexico  
S. Abdollahy, University of New Mexico  
H. Barsun, University of New Mexico  
A. Mammoli, University of New Mexico  
D. Dreisigmayer, Northern New Mexico College  
S. Willard, Public Utility Service Company of New Mexico  
B. Arrelano, Public Utility Service Company of New Mexico  
C. V Zeyl, East Penn Manufacturing

#### **2012ISGT0325, WAMPAC for INDIAN Power Sector**

J. Bardolia, K K Wagh Institute of Engineering Education and Research, India  
A. Mohole, K K Wagh Institute of Engineering Education and Research, India  
J.P.Shah, K K Wagh Institute of Engineering Education and Research, India

#### **2012ISGT0362, Integrating Variable Distributed Generation within Short-Term Electricity Markets**

D. M.A Ivarez, Universidad de los Andes, Colombia  
A. I. Cadena, Universidad de los Andes, Colombia  
J. M. Alzate, Universidad de los Andes, Colombia

#### **2012ISGT0210, Residue and Identification based Wide-area Damping Controller Design in Large-scale Power System**

Y. Zhao, Tsinghua University, China  
C. Lu, Tsinghua University, China  
Y. Liu, China Southern Power Grid Company  
Y. Han, Tsinghua University, China

#### **2012ISGT0246, Placement of Energy Storage Coordinated with Smart PV Inverters**

A. K. Barnes, University of Arkansas  
J. C. Balda, University of Arkansas  
A. Escobar Mejía, University of Arkansas  
S. O. Geurin, University of Arkansas

**2012ISGT0406, Role of Advance Metering Infrastructure for Power Sector of Nashik**

J. Shah, K K Wagh Institute of Engineering Education and Research, India  
A. Tyagi, K K Wagh Institute of Engineering Education and Research, India  
B. Ugale, K K Wagh Institute of Engineering Education and Research, India

**2012ISGT0467, Rule Based Algorithm for Plug-in Hybrid Electric Vehicles (PHEVs) Integration in Residential Electric Grid Areas**

H. Turker, Grenoble Electrical Engineering Laboratory, France  
A. Hably, Grenoble Image Parole Signal Automatique Laboratory, France  
S. Bacha, Grenoble Electrical Engineering Laboratory, France  
D. Chatroux, Commissariat at Energie Atomique, Grenoble, France

**2012ISGT0480, Congestion Management in WECC Grid**

M. Albaijat, University of California-Davis  
K. Aflaki, Illinois Institute of Technology  
B. Mukherjee, University of California-Davis

**2012ISGT0290, Impact of Rooftop PV Generation on Distribution Transformer and Voltage Profile of Residential and Commercial Networks**

A. S. Masoum, Curtin University, Australia  
P. S. Moses, Curtin University, Australia  
M. A. S. Masoum, Curtin University, Australia  
A. Abu-Siada, Curtin University, Australia

**2012ISGT0378, A New Approach to Decrease Reserve Demand When Bulky Wind Power or UHV is Connected**

Q. Wei, Henan Electric Research Institute, China  
W. Guo, Henan Electric Research Institute, China

**2012ISGT0026, Direct Torque Control for Variable Speed Wind Turbine Driven Induction Generator Using ANN Algorithm**

D. V. N. Ananth, VITAM Engineering College, India  
D. Himabindhn, VITAM Engineering College, India

**2012ISGT0342, Network Topological Analysis to Assess the Power Smart Grid**

R. Moreno, Universidad de los Andes, Colombia  
A. Torres, Universidad de los Andes, Colombia

**2012ISGT0113, Social Welfare Based Nodal Pricing with FACTS Cost Models in Hybrid Electricity Markets**

A. Kumar, University of Denver  
W. Z. Gao, University of Denver

**2012ISGT0286, Transmission Switching Action Modeling in Stochastic Energy and Spinning Reserve Market**

R. Aazami, Tarbiat Modares University, Iran

**2012ISGT0304, Application of PHEVs For Smart Grid In Indian Power Sector**

A. Shinde, K K Wagh Institute of Engineering Education and Research, India  
J. Shah, K K Wagh Institute of Engineering Education and Research, India  
E. Pisalkar, K K Wagh Institute of Engineering Education and Research, India

**2012ISGT0315, Inter-Area Stability Prediction Index Based on Phasorial Measurement**

O. Gómez, Universidad de Los Andes, Colombia  
M. A. Rios, Universidad de Los Andes, Colombia

**2012ISGT0478, The Impact of Terrestrial Radiation Effects on the Reliability of a Smart Grid**

X. Yao, Microelectronics Research and Development Corp.  
H. Ni, PJM  
G. Vera, Microelectronics Research and Development Corp.

## WEDNESDAY

### Wednesday Morning Sessions

**18 January, 08:00 AM – 08:30 AM**  
Thurgood Marshall Ballroom Foyer  
**Continental Breakfast**

### KEYNOTE SESSION

**18 January, 08:30 AM – 09:00 AM**  
Thurgood Marshall Ballroom

Chair: **Al Rotz**, Past President, IEEE Power and Energy Society  
Speaker:  
**Terry Boston**, CEO, PJM Interconnection, "Technology Enablement of the Grid"

### PLENARY SESSION

**Transactive Energy Techniques (1)** (plenary session)

**18 January, 09:00 AM – 10:00 AM**

Chair: **Farrokh Rahimi**, OATI

Panelists:

**Ali Ipakchi**, OATI (12SG0167, Issues, Challenges and Opportunities for Utilization of Demand-Side Resources in Support of Power System Operations)

**Ralph Masiello**, KEMA Consulting (12SG0154, Markets 3.0 Retail Wholesale Convergence)

**Ron Melton**, Pacific Northwest National Laboratories (12SG0047, Transactive Control: A Technique for Wide-spread Coordination of Responsive Smart Grid Assets)

## WEDNESDAY MORNING SNACK BREAK

18 January, 10:00 AM – 10:30

Thurgood Marshall Ballroom Foyer

### Transactive Energy Techniques (2) *(panel session)*

18 January, 10:30 AM – 12:00 PM

Thurgood Marshall North

Chair: **Farrokh Rahimi**, OATI

Panelists:

**Nivad Navid**, Midwest ISO (12SG0073, Challenges and Opportunities to Bring Prices to Devices)

**Robert Pratt**, Pacific Northwest National Laboratory (12SG0473, Transactive Control with Real-Time Prices and Double-Auction Feeder Market)

**Christopher Irwin**, U.S. Department of Energy (12SG0082, Advancing the Federal Agenda through Implementation of Transactive Energy Techniques)

**Anna Scaglione**, University of California, Davis (12SG0081, Queuing models for providing quality of service to transactive loads)

### Smart Grid for Buildings: Applications, Technologies, Standards *(panel session)*

18 January, 10:30 AM – 12:00 PM

Thurgood Marshall West

Chair: **Wendy Foslien** and **Tariq Samad**, Honeywell Automation and Control Solutions

Panelists:

**Jonathan Histed**, Novar, Ohio (12SG0074, Multi-Site Energy Management for the Smart Grid)

**Srinivas Katipamula**, Pacific Northwest National Laboratory (12SG0043, Smart Building Can Help Smart Grid: Transactive Control)

**Edward Koch**, Akuacom, California (12SG0088, Automated Demand Response—from Peak Shaving to Ancillary Services)

**David Holmberg**, National Institute of Standards and Technology (NIST) (12SG0344, A Standards Framework for Demand Response)

### Smart Grid Cyber Security *(paper session)*

18 January, 10:30 AM – 12:00 PM

Thurgood Marshall South

Session Chair: **Hassan Farhangi**, British Columbia Institute of Technology, Canada

#### 2012ISGT0022, Secure Authenticated Key Exchange with Revocation for Smart Grid

F. Zhao, Toshiba Corporation

Y. Hanatani, Toshiba Corporation

Y. Komano, Toshiba Corporation

B. Smyth, Toshiba Corporation

S. Ito, Toshiba Corporation

T. Kambayashi, Toshiba Corporation

#### 2012ISGT0123, A Study on Interdependencies of Cyber-Power Networks in Smart Grid Applications

B. Falahati, Mississippi State University

Y. Fu, Mississippi State University

#### 2012ISGT0261, Secure and Efficient Cryptosystem for Smart Grid Using Homomorphic Encryption

X. He, University of Southern California

M.O. Pun, Mitsubishi Electric Research Laboratories

C.C. Kuo, University of Southern California

#### 2012ISGT0268, Efficient Authentication Scheme for Data Aggregation in Smart Grid with Fault Tolerance and Fault Diagnosis

D. Li, Institute of Science and Technology, China

Z. Aung, Institute of Science and Technology, China

J. R. Williams, Massachusetts Institute of Technology

A. Sanchez, Massachusetts Institute of Technology

#### 2012ISGT0421, Smart Grid Cyber Security and Substation Network Security

J. Farquharson, Burns & McDonnell

A. Wang, Burns & McDonnell

J. Howard, Burns & McDonnell

#### 2012ISGT0202, Using an IPv6 Moving Target Defense to Protect the Smart Grid

S. Groat, Virginia Tech

M. Dunlop, Virginia Tech

W. Urbanski, Virginia Tech

R. Marchany, Virginia Tech

J. Tront, Virginia Tech

### Smart Home Solutions *(paper session)*

18 January, 10:30 AM – 12:00 PM

Thurgood Marshall East

Session Chair: **Cuong Nguyen**, General Electric

#### 2012ISGT0260, Demand Response Implementation in a Home Area Network: A Conceptual Hardware Architecture

M. Pipattanasomporn, Virginia Tech

M. Kuzlu, Virginia Tech

S. Rahman, Virginia Tech

#### 2012ISGT0411, An Integer Linear Programming Based Optimization for Home Demand-side Management in Smart Grid

Z. Zhu, Loughborough University, United Kingdom

J. Tang, Loughborough University, United Kingdom

S. Lambotharan, Loughborough University, United Kingdom

W. H. Chin, Toshiba Research Europe

Z. Fan, Toshiba Research Europe

#### 2012ISGT0139, Secure Remote Access to Smart Energy Home Area Networks

B. Vaidya, University of Ottawa, Canada

D. Makrakis, University of Ottawa, Canada

H. Mouftah, University of Ottawa, Canada

**2012ISGT0234, Residential Task Scheduling Under Dynamic Pricing Using the Multiple Knapsack Method**

N. Kumaraguruparan, University of Minnesota  
H. Sivaramakrishnan, University of Minnesota  
S. S. Sapatnekar, University of Minnesota

**2012ISGT0309, Detection of Operating Condition in Home Appliances Using Current Data on Electric Distribution Boards**

Y. Iwafune, University of Tokyo, Japan  
Y. Yagita, University of Tokyo, Japan  
K. Ogimoto, University of Tokyo, Japan

**2012ISGT0374, Fusebox Dialects: Central Appliance Recognition for a Smarter Grid**

A. Dalen, Karlsruhe Institute of Technology, Germany  
C. Weinhardt, Karlsruhe Institute of Technology, Germany

**Standards and Testing Technologies** *(paper session)*

**18 January, 10:30 AM – 12:00 PM**

**Madison A**

Session Chair: **Yan Zhou**, Argonne National Laboratory

**2012ISGT0128, Overview of SAE Standards for Plug-in Electric Vehicle**

T. Bohn, Argonne National Laboratory  
H. Chaudhry, Argonne National Laboratory

**2012ISGT0358, Update and Review of IEEE P2030 Smart Grid Interoperability and IEEE 1547 Interconnection Standards**

T. Basso, National Renewable Energy Laboratory  
J. Hambrick, National Renewable Energy Laboratory  
D. DeBlasio, National Renewable Energy Laboratory

**2012ISGT0452, Reviewing Smart Grid Standards for Protection, Control, and Monitoring Applications**

M. G. Kanabar, GE Digital Energy  
I. Voloh, GE Digital Energy  
D. McGinn, GE Digital Energy

**2012ISGT0039, A New Standard for Integrity of Home Network Equipment Connected to the Smart Grid**

A. R. Martin, TE Connectivity, California, USA

**2012ISGT0103, A Digital Test bed for a PHEV/PEV Enabled Parking Lot in a Smart Grid Environment**

W. Su, North Carolina State University  
W. Zeng, North Carolina State University  
M.Y. Chow, North Carolina State University

**2012ISGT0450, A Test Bed for Self-regulating Distribution Systems: Modeling Integrated Renewable Energy and Demand Response in the GridLAB-D/ MATLAB Environment**

D. Wang, University of Victoria, Canada  
B. d. Wit, University of Victoria, Canada  
S. Parkinson, University of Victoria, Canada  
C. Crawford, University of Victoria, Canada  
N. Djilali, University of Victoria, Canada  
D. Chassin, Pacific Northwest National Laboratory, USA  
J. Fuller, Pacific Northwest National Laboratory, USA

**Charging Stations in Microgrids** *(paper session)*

**18 January, 10:30 AM – 12:00 PM**

**Madison B**

Session Chair: **Géza Joós**, McGill University, Canada

**2012ISGT0122, Optimal Design of Grid-Interfaced EV Chargers with Integrated Generation**

S. J. Gunter, Massachusetts Institute of Technology  
K. K. Afridi, Massachusetts Institute of Technology  
D. J. Perreault, Massachusetts Institute of Technology

**2012ISGT0115, Photovoltaic Charging Station for Plug-In Hybrid Electric Vehicles in a Smart Grid Environment**

G. Preetham, University of Houston  
W. Shireen, University of Houston

**2012ISGT0249, The impacts of charging pricing strategy on the return of interest of a PHEV charging Station**

D. He, Georgia Tech  
Z. Tan, Georgia Tech  
L. Suneja, Georgia Tech  
R. G. Harley, Georgia Tech

**2012ISGT0274, Modeling and Studying of Power flow in a Parking Lot with Plug-in Vehicles and the Impact in the Public Utility**

F. Andrade, Technical University of Catalonia, Spain  
J. J. Cárdenas, Technical University of Catalonia, Spain  
L. Romeral, Technical University of Catalonia, Spain  
J. Cusidó, Technical University of Catalonia, Spain

**2012ISGT0424, Charging Station Selection Optimization for Plug-in Electric Vehicles: An Oligopolistic Game-theoretic Framework**

J. Joaquín Escudero-Garzás, Universitat Autònoma de Barcelona, Spain  
G. Seco-Granados, Universitat Autònoma de Barcelona, Spain

## Wednesday Afternoon Sessions

### Smart Grid Adds Value to Solar Photovoltaics *(panel session)*

18 January, 01:00 PM – 02:30 PM

Thurgood Marshall North

Chair: **Saifur Rahman**, Virginia Tech

Panelists:

**Saifur Rahman**, Virginia Tech (12SG0048, Smart Grid Adds Value to Solar Photovoltaics)

**Tang Yi**, Southeast University, China (12SG0089, How to achieve large scale solar PV penetration in China)

**Marta Marmioli**, Mitsubishi Electric Company, Japan (12SG0085, Mitsubishi Electric Smart Grid for a Future Low Carbon Society)

**Miroslav Begovic**, Georgia Tech (12SG0134, Renewable Energy Technologies: the Future of Photovoltaics)

**Jimmy Rhee**, Commonwealth of Virginia

### Women in Engineering *(panel session)*

18 January, 01:00 PM – 02:30 PM

Thurgood Marshall West

Chair: **Shaghayegh Bahramirad**, S&C Electric

Panelists:

**Cheri A. Warren**, Vice-President, Smart Grid, National Grid, Waltham, USA

**Lina Bertling**, Professor, Chalmers University, Gothenburg, Sweden

**Wanda Reder**, Vice-President, S&C Electric, USA

**Noel N. Schulz**, Professor, Kansas State University, Kansas, USA

### Smart Grid Cyber Security *(panel session)*

18 January, 01:00 PM – 02:30 PM

Thurgood Marshall South

Chair: **Thomas Overbye**, University of Illinois

Panelists:

**Carl Hauser**, Washington State University (12SG0063, Trust Research to Address Uncertainty in Security for the Smart Grid)

**David Nicol**, University of Illinois (12SG0076, Scaling Issues for NERC CIP Electronic Security Perimeter Compliance Assessment)

**Bill Sanders**, University of Illinois (12SG0083, Building Resilient Infrastructures for Smart Energy Systems)

**Sean Smith**, Dartmouth University (12SG0075, Cryptographic Scalability Challenges in the Smart Grid)

### Smart Building Solutions *(paper session)*

18 January, 01:00 PM – 02:30 PM

Thurgood Marshall East

Session Chair: **Amin Khodaei**, Adica

### 2012ISGT0305, Moving Towards a Smart Hospital

J. Sarkar, KKWIEER, Nashik, India

N. Kushwaha, KKWIEER, Nashik, India

J. Shah, KKWIEER, Nashik, India

### 2012ISGT0336, A Demand Based Approach to Optimisation of Energy Supply Mix for Smart Buildings

M. Prodanovic, IMDEA Energía Institute, Spain

T. Gafurov, IMDEA Energía Institute, Spain

M. B. Téllez, IMDEA Energía Institute, Spain

### 2012ISGT0296, Network Constrained Economic Demand Dispatch of Controllable Building Electric Loads

J. Berardino, Drexel University, USA

Mohammed Muthalib, Drexel University, USA

C.O. Nwankpa, Drexel University, USA

### 2012ISGT0195, Economic Model Predictive Control for Building Climate Control in a Smart Grid

R. Halvgaard, Technical University of Denmark, Denmark

N. K. Poulsen, Technical University of Denmark, Denmark

H. Madsen, Technical University of Denmark, Denmark

J. B. Jørgensen, Technical University of Denmark, Denmark

### 2012ISGT0161, User Interaction Interface for Energy Management in Smart Homes

B. Becker, Karlsruhe Institute of Technology, Germany

A. Kellerer, Karlsruhe Institute of Technology, Germany

H. Schmeck, Karlsruhe Institute of Technology, Germany

### Smart Grid Optimization *(paper session)*

18 January, 01:00 PM – 02:30 PM

Madison A

Session Chair: **Herminio Pinto**, Nexant

### 2012ISGT0219, Collaborative Optimization of Distribution Grid Operation

H. Fan, General Electric

P. Backscheider, General Electric

J. Fan, General Electric

J. D. McDonald, General Electric

### 2012ISGT0278, Smart Grid Software Applications as an Ultra-Large-Scale System: Challenges for Evolution

M. Anvaari, Norwegian University of Science and Technology

D. S. Cruzes, Norwegian University of Science and Technology

R. Conradi, Norwegian University of Science and Technology

### 2012ISGT0451, An Economical Way of Solving Profit Maximization Problems in Smart Grid

T. Cui, University of Southern California

H. Goudarzi, University of Southern California

S. Hatami, University of Southern California

S. Nazarian, University of Southern California

M. Pedram, University of Southern California

**2012ISGT0306, Optimal Job Scheduling with Day-ahead Price and Random Local Distributed Generation: A Two-stage Robust Approach**

A. Danandeh, University of South Florida  
L. Zhao, University of South Florida  
B. Zeng, University of South Florida  
M. Abdollahian, University of South Florida

**2012ISGT0317, Energy Production Cost and PAR Minimization in Multi-Source Power Networks**

S. Ghebremariam, University of Akron  
S. Beygi, University of Akron  
H. R. Bahrami, University of Akron  
Y. Sozer, University of Akron  
H. Mohsenian-Rad, Texas Tech University

**2012ISGT0319, Prediction and Optimization Methods for Electric Vehicle Charging Schedules in the EDISON Project**

A. Aabrandt, Technical University of Denmark  
P. B. Andersen, Technical University of Denmark  
A. B. Pedersen, Technical University of Denmark  
S. You, Technical University of Denmark  
B. Poulsen, Technical University of Denmark  
N. O'Connell, Technical University of Denmark  
J. Ostergaard, Technical University of Denmark

**Electric Vehicle Technologies** (*paper session*)

**18 January, 01:00 PM – 02:30 PM**

**Madison B**

Session Chair: **G.Kumar Venayagamoorthy**, Clemson University

**2012ISGT0228, Modelling of System Components for Vehicle-to-Grid (V2G) and Vehicle-to-Home (V2H) Applications with Plug-in Hybrid Electric Vehicles (PHEVs)**

H. Turker, Grenoble Electrical Engineering Laboratory, France  
S. Bacha, Grenoble Electrical Engineering Laboratory, France  
D. Chatroux, Commissariat at Energie Atomique, Grenoble, France  
A. Hably, Grenoble Image Parole Signal Automatique Laboratory, France

**2012ISGT0272, Electricity Pricing for PHEV Bottom Charge in Daily Load Curve based on Variation Method**

M. Takagi, University of Tokyo, Japan  
Y. Iwafune, University of Tokyo, Japan  
K. Yamaji, Research Institute of Innovative Technology for the Earth, Japan  
H. Yamamoto, Central Research Institute of Electric Power Industry, Japan  
K. Okano, Central Research Institute of Electric Power Industry, Japan  
R. Hiwatari, Central Research Institute of Electric Power Industry, Japan  
T. Ikeya, Central Research Institute of Electric Power Industry, Japan

**2012ISGT0301, Potential for Electric Vehicles to Provide Power System Reserve**

E. Keane, University College Dublin, Ireland  
D. Flynn, University College Dublin, Ireland

**2012ISGT0337, Benchmarking Electric Vehicle Charging Control Strategies**

A. Schuller, Karlsruhe Institute of Technology, Germany  
J. Ilg, Karlsruhe Institute of Technology, Germany  
C. V. Dinther, Karlsruhe Institute of Technology, Germany

**2012ISGT0373, PEV-Based Combined Frequency and Voltage Regulation for Smart Grid**

C. Wu, Tsinghua University, China  
H. Mohsenian-Rad, Texas Tech University, USA  
J. Huang, Chinese University of Hong Kong, Hong Kong  
J. Jatskevich, University of British Columbia, Canada

**2012ISGT0121, Evaluation of EV Charging Load Contributing to stabilize PV output with Consideration for Rapid Charge**

T. Ito, University of Tokyo, Japan  
Y. Iwafune, University of Tokyo, Japan  
R. Hiwatari, Central Research Institute of Electric Power Industry, Japan

**WEDNESDAY AFTERNOON SNACK BREAK**

**18 January, 2:30 PM – 3:00**

**Thurgood Marshall Ballroom Foyer**

**Smart Grids in Latin America: Opportunities, Developments and Trends**

(*panel session*)

**18 January, 03:00 PM – 05:00 PM**

**Thurgood Marshall North**

Chair: **Luiz A. Barroso**, PSR, Brazil

Panelists:

**Renato Cespedes**, RConsulting Group, Colombia (12SG0066, Lessons Learned and Future Challenges for the Development of Smart Grids in Latin America)

**Luiz Carlos Santini Jr.**, ENERSUL (12SG0370, How to Bring the Customers to Cooperate with Utilities on Smart Grid implementations)

**Nelson Kagan**, Escola Politecnica da Universidade de Sao Paulo, Brazil (12SG0110, A Roadmap for the Implementation of Smart Grids in Brazil)

**Rodrigo Palma**, Universidad de Chile, Chile (12SG0371, Social SCADA and Demand Response for sustainable isolated microgrids)

**Rafael Ferreira**, PSR, Brazil (12SG0334, Regulatory challenges for Smart Grid developments in Brazil)  
Renato Cespedes, RConsulting Group, Colombia

## **Electric Vehicles and the Smart Grid** (panel session)

18 January, 03:00 PM – 05:00 PM

Thurgood Marshall West

Chair: **Russell Lefevre**, Consultant

Panelists:

**Saifur Rahman**, Virginia Tech (12SG0054, Mitigation of Distribution Level Impact of Electric Vehicles)

**Mladen Kezunovic**, Texas A&M University (12SG0080, BEVs/PHEVs as Dispersed Energy Storage in Smart Grid)

**Russell Lefevre**, Consultant (12SG0464, Energy and Power Needs of Electric Vehicles)

**ML Chan**, LSIS Company, Korea (12SG0087, Impacts of EVs on Smart Grid Asia)

**Phil Krein**, University of Illinois

## **PMUs and Wide Area Measurements** (paper session)

18 January, 03:00 PM – 05:00 PM

Thurgood Marshall South

Session Chair: **Chaoyang Jing**, eMIT

### **2012ISGT0257, Observability Analysis and Critical Measurement Detection for Power Systems Measured by PMUs**

M. Göll, Northeastern University, USA

A. Abur, Northeastern University, USA

### **2012ISGT0245, Communication Network Modeling and Simulation for Wide Area Measurement Applications**

Y. Deng, Virginia Polytechnic Institute & State University

H. Lin, Virginia Polytechnic Institute & State University

A. G. Phadke, Virginia Polytechnic Institute & State University

S. Shukla, Virginia Polytechnic Institute & State University

J. S. Thorp, Virginia Polytechnic Institute & State University

L. Mili, Virginia Polytechnic Institute & State University

### **2012ISGT0232, Redundancy Architecture Design of PMU Networks for Availability of Synchrophasors**

M. C. Ruschmann, Binghamton University, USA

N. E. Wu, Binghamton University, USA

J. Huang, Binghamton University, USA

### **2012ISGT0383, Real-time Power System Analysis and Security Monitoring by WAMPAC Systems**

V. Salehi, Florida International University, USA

A. Mazloomzadeh, Florida International University, USA

J. F. Fernandez, Florida International University, USA

O. A. Mohammed, Florida International University, USA

### **2012ISGT0036, Co-ordinated Control of Inter-area Oscillations using SMA and LMI**

A. Pal, Virginia Tech, USA

J. S. Thorp, Virginia Tech, USA

## **Smart Grid Technologies and Applications** (paper session)

18 January, 03:00 PM – 05:00 PM

Thurgood Marshall East

Session Chair: **Richard Brown**, Quanta Technology

### **2012ISGT0094, What Your Smart Grid Needs From a Power Management System**

F. Kling, Operation Technology Inc, USA

### **2012ISGT0231, Modernizing Power Grids with Distributed Intelligence and Smart Grid-Ready Instrumentation**

R. Piacentini, National Instruments, USA

### **2012ISGT0220, Mission Critical Infrastructure for Installations**

C. D. Lute, Concurrent Technologies Corporation, USA

T. L. Conrad, Concurrent Technologies Corporation, USA

S. A. Kenner, Concurrent Technologies Corporation, USA

C. L. Tremel, Concurrent Technologies Corporation, USA

### **2012ISGT0458, Multi Agent System based Fault Location and Isolation in a Smart Microgrid System**

S. Alwala, West Virginia University,

A. Feliachi, West Virginia University

M. A. Choudhry, West Virginia University

### **2012ISGT0375, Induced Chaos for an Agile Smart Grid**

R. Kumar, Albeado, Inc, USA

C. Reed, Albeado, Inc, USA

P. D. Ray, Albeado, Inc, USA

### **2012ISGT0395, Assuring Transient Stability in the Smart Grid**

R. Kumar, Albeado, Inc, USA

## **Wind Energy Applications** (paper session)

18 January, 03:00 PM – 05:00 PM

Madison A

Session Chair: **Johan Enslin**, UNC Charlotte

### **2012ISGT0379, Finite State Markov Chain Model for Wind Generation Forecast - A Data-driven Spatiotemporal Approach**

S. Murugesan, Arizona State University

J. Zhang, Arizona State University

V. Vittal, Arizona State University

### **2012ISGT0445, Operating Reserve Requirements in a Power System with Dispersed Wind Generation**

M. Ghofrani, University of Nevada

A. Arabali, University of Nevada

M. Etezadi-Amoli, University of Nevada

Y. Baghzouz, University of Nevada



**2012ISGT0448, Study of the Implementation of STATCOM on DFIG-Based Wind Farm Connected to a Power System**

T. M. Masaud, Colorado School of Mines  
P.K. Sen, Colorado School of Mines

**2012ISGT0364, Wind Power Integration via Aggregator-Consumer Coordination: A Game Theoretic Approach**

C. Wu, Tsinghua University, China  
H. Mohsenian Rad, Texas Tech University, USA  
J. Huang, Chinese University of Hong Kong, Hong Kong

**Microgrid Monitoring and Islanding** (*paper session*)

*18 January, 03:00 PM – 05:00 PM*

**Madison B**

Session Chair: **C.W. Ten**, Michigan Technological University

**2012ISGT0313, Post Disturbance Island Identification via State Estimation**

L. Zhang, Northeastern University  
A. Abur, Northeastern University

**2012ISGT0314, Distributed Generation Regulation for Intentional Islanding in Smart Grids**

M. Brenna, Department of Energy, Politecnico di Milano, Italy  
F. Foiadelli, Department of Energy, Politecnico di Milano, Italy  
D. Zaninelli, Department of Energy, Politecnico di Milano, Italy  
P. Petroni, Enel Distribuzione S.p.A, Italy  
G. Sapienza, Politecnico di Milano, Italy

**2012ISGT0065, Energy Management System Architecture for New Energy Power Supply System of Islands**

C. Li, Hunan University, China  
Y. Tan, Hunan University, China  
Y. Cao, Hunan University, China  
Y. Liu, Hunan University, China

G. Qi, Hunan University, China  
R. Zhang, Hunan University, China  
S. Shao, Virginia Polytechnic Institute and State University, USA  
H. Zhou, Zhejiang University, China

**2012ISGT0035, Cooperative Operation and Optimal Design for Islanded Microgrid**

C. Wang, Tianjin University, China  
M. Liu, Tianjin University, China  
L. Guo, Tianjin University, China

**2012ISGT0216, Energy Management Strategy of Islanded Microgrid Based on Power Flow Control**

Y. Zhang, Tianjin University, China  
H. J. Jia, Tianjin University, China  
L. Guo, Tianjin University, China

**Wednesday Evening Dinner Reception**

*18 January, 06:15 PM – 08:30 PM*

**Thurgood Marshall Ballroom**

Chair:

**Mick Yauger** (International Brotherhood of Teamsters)  
“Helmets to Hardhats Program for Veterans”

Introduction:

**Jan Scruggs** (Founder & President, Vietnam Veterans Memorial Fund)  
“Education Center at the Vietnam War Memorial Wall”

Speaker:

**Colonel David Sutherland** (Special Assistant to the Chairman of the Joint Chiefs of Staff)  
“National Renewable Energy, Energy Security and Smart Grid Initiatives”

THURSDAY

**Thursday Morning Sessions**

*19 January, 08:00 AM – 08:30 AM*

**Thurgood Marshall Ballroom Foyer**

**CONTINENTAL BREAKFAST**

**KEYNOTE SESSION**

*19 January, 08:30 AM – 09:00 AM*

**Thurgood Marshall Ballroom**

Chair: **Steven Pullins**, President, Horizon Energy

Speaker:

**James P. Avery**, Senior Vice President - Power Supply, San Diego Gas & Electric  
“Challenges of Deep Penetration of Renewables”

## PLENARY SESSION

### Smart Grid Benefits on Asset Management *(plenary session)*

19 January, 09:00 AM – 10:00 AM

Chair: **Paul Myrda**, Electric Power Research Institute

Panelists:

**Paul Myrda**, Electric Power Research Institute  
(12SG0055, Benefits of Smart Grid for Asset Management)

**Dan Ton**, U.S. Department of Energy

**Predrag Vujovic**, Long Island Power Authority  
(12SG0056, Standards-Based Enterprise Information Management for Utility Assets)

**Bruce Rogers**, Tennessee Valley Authority (12SG0062, New Technologies for Transmission Maintenance and Asset Management)

**Neil Weisenfeld**, Consolidated Edison (12SG0060, Cable Fleet Management)

## THURSDAY MORNING SNACK BREAK

19 January, 10:00 AM – 10:30

Thurgood Marshall Ballroom Foyer

### Load Modeling and Control *(panel session)*

19 January, 10:30 AM – 12:00 PM

Thurgood Marshall North

Chair: **David Chassin**, Pacific Northwest National Laboratory, USA

Panelists:

**Scott Backhaus**, Los Alamos National Laboratory, USA  
912SG0449, Experimental Determination of Dynamic Models for Commercial HVAC Loads)

**David Chassin**, Pacific Northwest National Laboratory, USA  
(12SG0428, Aggregate Modeling and Control of Demand Response)

**Sean Meyn**, University of Illinois (12SG0479, Real-time Prices in an Entropic Grid)

**Dmitry Kosterev**, BPA (12SG0434, Load Model for Stability Studies)

**Guang Li**, ERCOT

### A Smart Grid Perspective of Renewable and Distributed Energy Resources *(panel session)*

19 January, 10:30 AM – 12:00 PM

Thurgood Marshall West

Chair: **Khosrow Moslehi**, ABB

Panelists:

**Rana Mukerji**, NYISO (12SG0254, Leveraging Advanced and Smart Technologies to Integrate Renewable Energy in New York)

**Dave Maggio**, ERCOT (12SG0349, Challenges of Large-Scale Wind Integration in the ERCOT System)

**Erich Gunther**, EnerNex (12SG0363, Enabling Pervasive Deployment of Renewable and Distributed Energy Resources)

**Darius Shirmohammadi**, Shir Consultants  
(12SG0360, A Changing Perspective on the Impact and Capabilities of Renewable Resources on Power Systems)

### Batteries, Chargers, Circuits, Vehicle Use and V2G: Do They Match? *(panel session)*

19 January, 10:30 AM – 12:00 PM

Thurgood Marshall South

Chair: **Dan Santini**, Argonne National Laboratory

Panelists:

**T. Duong**, U.S. Department of Energy (12SG0394, A Review of Lithium-ion Battery Properties of Plug-in Hybrid and Electric Vehicles in Light of Seminal Assumptions on the Viability of V2G)

**Y. Zhou**, Argonne National Laboratory (12SG0446, Keeping Plug-in Electric Vehicles Connected to the Grid – Patterns of Vehicle Use)

**Rajit Gadh**, UCLA Smart Grid Energy Research Center

**Eric Rask**, Argonne National Laboratory (12SG0447, On Charging Equipment and Batteries in Plug-in Vehicles: Present Status)

### Applications of Computation Methods *(paper session)*

19 January, 10:30 AM – 12:00 PM

Thurgood Marshall East

Session Chair: **Yong Fu**, Mississippi State University

#### 2012ISGT0267, Distributed Methods for Solving the Security-Constrained Optimal Power Flow Problem

D. Phan, Watson Research Center, USA

J. Kalagnanam, Watson Research Center, USA

#### 2012ISGT0433, Efficient Distributed OPF for Decentralized Power System Operations and Electricity Markets

M. Costley, Georgia Institute of Technology, USA

S. Grijalva, Georgia Institute of Technology, USA

#### 2012ISGT0205, Pricing and Peak Aware Scheduling Algorithm

X. Li, University of Rhode Island

J. C. Lo, University of Rhode Island

#### 2012ISGT0441, Analytical Description of a Series Fault on a dc Bus

A. L. Gattozzi, University of Texas at Austin

J. D. Herbst, University of Texas at Austin

F. M. Uriarte, University of Texas at Austin

R. E. Hebner, University of Texas at Austin

## Impact of Smart Grid on Distribution Systems *(paper session)*

19 January, 10:30 AM – 12:00 PM

Madison A

Session Chair: **Richard. Gordus**, ComEd

### 2012ISGT0208, Topology Identification in Distribution Network with Limited Measurements

Y. Sharon, Massachusetts Institute of Technology  
A. M. Annaswamy, Massachusetts Institute of Technology  
A. L. Motto, Corporate Research, Siemens  
A. Chakraborty, Corporate Research, Siemens

### 2012ISGT0007, Calculation of Load Point Indices of Distribution Systems Due To Inserting a DG Device In Radial Systems

A.M. Abdullah, Cairo University, Egypt

### 2012ISGT0218, Analyzing the Impact of Electric Vehicles on Distribution Networks

B. Cuifen, Tsinghua University, China  
G. Wensheng, Tsinghua University, China  
L. Jing, Siemens Ltd  
L. Hua, Siemens Ltd

### 2012ISGT0250, Enhancing Power Quality on Distribution Systems with Fault-Current Limiters

A. Escobar, University of Arkansas  
J. C. Balda, University of Arkansas  
J. Bourne, University of Arkansas  
A. K. Barnes, Arkansas Power Electronics International Inc.  
R. M. Schupbach, Arkansas Power Electronics International Inc.

### 2012ISGT0193, Decentralized Topology Inference of Electrical Distribution Networks

N. Honeth, KTH Royal Institute of Technology, Sweden  
A. Saleem, KTH Royal Institute of Technology, Sweden  
K. Zhu, KTH Royal Institute of Technology, Sweden  
L. Vanfretti, KTH Royal Institute of Technology, Sweden  
L. Nordström, KTH Royal Institute of Technology, Sweden

## Smart Transformers in Power Systems

*(paper session)*

19 January, 10:30 AM – 12:00 PM

Madison B

Session Chair: **Guohui Yuan**, ManTech (DOE)

### 2012ISGT0044, Three-phase Instrument Transformer Calibration with Synchronized Phasor Measurements

Z. Wu, Virginia Polytechnic Institute and State University  
K. Thomas, Dominion Virginia Power  
R. Sun, Virginia Polytechnic Institute and State University  
V. A. Centeno, Virginia Polytechnic Institute and State University  
A. G. Phadke, Virginia Polytechnic Institute and State University

### 2012ISGT0223, Distribution Transformer Loading with Deferred Loads

A. Vukojevic, General Electric  
N. Parwal, General Electric  
C. Yasko, General Electric

### 2012ISGT0226, Aging Rate of Low Voltage Transformer for a High Penetration of Plug-in Hybrid Electric Vehicles (PHEVs)

H. Turker, Grenoble Electrical Engineering Laboratory, France  
S. Bacha, Grenoble Electrical Engineering Laboratory, France  
D. Chatroux, Commissariat at Energie Atomique, Grenoble, France  
A. Hably, Grenoble Image Parole Signal Automatique Laboratory, France

### 2012ISGT0281, Overloading of Distribution Transformers in Smart Grid Due to Uncoordinated Charging of Plug-In Electric Vehicles

M. A. S. Masoum, Curtin University, Australia  
P. S. Moses, Curtin University, Australia  
S. Hajforoosh, Islamic Azad University, Iran

### 2012ISGT0275, Distribution Transformer Stress in Smart Grid with Coordinated Charging of Plug-In Electric Vehicles

M. A. S. Masoum, Curtin University, Australia  
P. S. Moses, Curtin University, Australia  
S. Hajforoosh, Islamic Azad University, Iran

### 2012ISGT0207, Architecture of Solid State Transformer-based Energy Router and Models of Energy Traffic

J. Zhang, North Carolina State University  
W. Wang, North Carolina State University  
S. Bhattacharya, North Carolina State University

## Thursday Afternoon Sessions

### Smart Grid for Infrastructure Protection, Emergency Response, and System Restoration *(panel session)*

19 January, 01:00 PM – 02:30 PM

Thurgood Marshall North

Chair: **Jim Kavicky**, Argonne National Laboratory

Panelists:

**Eric Rollison**, National Renewable Energy Laboratory (12SG0237, Reliability Considerations from the Integration of Smart Grid)

**Jeff Dagle**, Pacific Northwest National Laboratory (12SG0153, Achieving Resiliency by Eliminating Common Mode Failures in the Smart Grid)

**Guohui Yuan**, ManTech (DOE) (12SG0322, Improving Grid Reliability through Integration of Distributed PV and Energy Storage)

**Géza Joós**, McGill University

## **ISO/RTO Experience and Perspectives on Demand Response Participation in Ancillary Services Markets** *(panel session)*

**19 January, 01:00 PM – 02:30 PM**

**Thurgood Marshall West**

Chair: **Joseph H. Eto**, Lawrence Berkeley National Laboratory

Panelists:

**John Goodin**, California ISO (12SG0339, California Independent System Operator Demand Response & Proxy Demand Resources)

**Paul Wattles**, ERCOT (12SG0440, Load Resources Providing Ancillary Services in Electric Reliability Council of Texas, ERCOT)

**Peter Langbein**, PJM Interconnection (12SG0427, Demand Response Participation in PJM Wholesale Markets)

## **R&D to Advance Existing Smart Grid Cyber Security** *(panel session)*

**19 January, 01:00 PM – 02:30 PM**

**Thurgood Marshall South**

Chair: **Akhlesh Kaushiva**, U.S. Department of Energy

Panelists:

**A. David McKinnon**, Pacific Northwest National Laboratory (12SG0437, Demand Response Participation in PJM Wholesale Markets)

**Bill Sanders**, University of Illinois (12SG0470, TCIPG: Trustworthy Cyber Infrastructure for the Power Grid Overview)

**Joseph Giampapa**, Carnegie Mellon University (12SG0469, SCADA/EMS Security Assessments and Autonomous Remedies)

**Stacy Prowell**, Oak Ridge National Laboratory (12SG0459, Automated Vulnerability Detection for Compiled Smart Grid Software)

## **Power Electronic Applications to Smart Grid** *(paper session)*

**19 January, 01:00 PM – 02:30 PM**

**Thurgood Marshall East**

Session Chair: **Adel Nasiri**, University of Wisconsin-Milwaukee

### **2012ISGT0141, Enhanced Modeling and Control of VSIs in Microgrids Operating in Grid-Connected Mode**

L. Rese, Universidade Federal de Santa Catarina, Brazil

A. Simoes Costa, Universidade Federal de Santa Catarina, Brazil

A. S. e Silva, Universidade Federal de Santa Catarina, Brazil

### **2012ISGT0310, Optimization of Task Sharing towards Multi-Agent Control of PEBB Based Power Systems**

E. Krüger, Aachen University, Germany

J. Liu, Aachen University, Germany

F. Ponci, Aachen University, Germany

A. Monti, Aachen University, Germany

### **2012ISGT0243, Design and Control of a Grid-Connected Three-Phase 3-Level NPC Inverter for Building Integrated Photovoltaic Systems**

R. Y. Kim, Chungnam National University, Korea

H. Cha, Chungnam National University, Korea

B. M. Song, Baylor University, USA

K. Y. Lee, Baylor University, USA

### **2012ISGT0126, Modified Grid-Connected Current Source Inverter for Multistring PV System**

D. Amorndechaphon, University of Phayao, Thailand

S. Premrudeepreechacharn, ChiangMai University, Thailand

K. Higuchi, University of Electro-Communications, Japan

### **2012ISGT0388, Study of Unified Control of STATCOM to resolve the Power Quality Issues of a Grid-connected Three phase PV System**

J. Han, West Virginia University

S. Khushalani-Solanki, West Virginia University

J. Solanki, West Virginia University

J. Schoene, EnerNex

## **Smart Grid Data Management** *(paper session)*

**19 January, 01:00 PM – 02:30 PM**

**Madison A**

Session Chair: **Faramarz Maghsoodlou**, Cisco

### **2012ISGT0175, Improving Utility Operational Excellence through Non-Operational Data Management**

R. Shetty, GE Digital Energy, USA

J. Fan, GE Digital Energy, USA

J. D. McDonald, GE Digital Energy, USA

### **2012ISGT0380, A Data Mining Framework for Online Dynamic Security Assessment: Decision Trees, Boosting, and Complexity Analysis**

M. He, Arizona State University, USA

J. Zhang, Arizona State University, USA

V. Vittal, Arizona State University, USA

### **2012ISGT0214, Data Mining as an Enabling Technology for Home Energy Management System**

S. Veleva, Saints Cyril & Methodius University of Skopje, Macedonia

D. Davcev, Saints Cyril & Methodius University of Skopje, Macedonia

### **2012ISGT0283, Dynamic Prediction of Energy Delivery Capacity of Power Networks: Unlocking the Value of Real-Time Measurements**

P. Schell, Ampacimon, Belgium

L. Jones, Alstom Grid, USA

P. Mack, Pepite, Belgium

B. Godard, University of Liège, Belgium

J. L. Lilien, University of Liège, Belgium

### **2012ISGT0294, Data Protection and Smart Grid Communication – The European Perspective**

F. Pallas, Karlsruhe Institute of Technology, Germany

**2012ISGT0356, Development of a Real-Time, High-Speed Distribution Level Data Acquisition System**

J. Bank, National Renewable Energy Laboratory, USA  
B. Kroposki, National Renewable Energy Laboratory, USA

**Control and Monitoring Systems** *(paper session)*

**19 January, 01:00 PM – 02:30 PM**

**Madison B**

Session Chair: **William Rosehart**, University of Calgary

**2012ISGT0341, Control and Monitoring Requirements for Distribution Systems with High Penetration of Renewable Energy Sources**

A. Yazdani, Quanta Technology, USA  
F. Katiraei, Quanta technology, USA

**2012ISGT0311, Distributed Hierarchical Control for Renewable Energy Integration in a Smart Grid**

A. Kiani, Institute of Automatic Control Engineering,  
Technische Universitat Munchen, Germany  
A. Annaswamy, Massachusetts Institute of Technology

**2012ISGT0312, A Concept of Robust Power System Security and its Application under Renewable Energy Sources Penetration**

Y. Okumoto, Chugoku Electric Power Company  
N. Yorino, Hiroshima University  
Y. Zoka, Hiroshima University  
Y. Sasaki, Hiroshima University  
S. Fujita, Shikoku Electric Power Co  
T. Yamanaka, Hiroshima University

**2012ISGT0173, Voltage Stability Improvement through Centralized Reactive Power Management on the Smart Grid**

H. Kazari, Sharif University of Technology, Iran  
A. Abbaspour Tehrani Fard, Sharif University of Technology, Iran  
A. S. Dobakhshari, Sharif University of Technology, Iran  
A. M. Ranjbar, Sharif University of Technology, Iran

**2012ISGT0117, Smart Control Interface for Robust Operation of DG units in grid connected and Islanded modes**

A. Kahrobaeian, University of Alberta, Canada  
Y. A. R. I. Mohamed, University of Alberta, Canada  
2012ISGT0238, Stochastic Model Predictive Control  
Method for Microgrid Management  
A. Hooshmand, University of Houston  
M. H. Poursaeidi, University of Houston  
J. Mohammadpour, University of Houston  
H. A. Malki, University of Houston  
K. Grigoriadis, University of Houston

**THURSDAY AFTERNOON SNACK BREAK**

**19 January, 2:30 PM – 3:00**

**Thurgood Marshall Ballroom Foyer**

**Smart Grid with a European Perspective**

*(panel session)*

**19 January, 03:00 PM – 05:00 PM**

**Thurgood Marshall North**

Chair: **Lina Bertling**, Chalmers University, Sweden

Panelists:

**Wiktor Raldow**, EU Commission (12SG0104, Smart Grids from a European perspective)

**Magnus Callavik**, ABB (12SG0090, Technologies for a smart grid development with examples of projects in Europe)

**Maria Sandqvist**, Teknikforetagen (12SG0068, What is needed to make smart grid possible?)

**Gerard Smit**, University of Twente (12SG0091, Efficient ICT for efficient Smart Grids)

**Alice Waltham**, ÅF, UK (12SG0102, What are the benefits of Smart Grid?)

**MVDC and MVAC Systems in Smart Grid and Renewable Energy Applications** *(panel session)*

**19 January, 03:00 PM – 05:00 PM**

**Thurgood Marshall West**

Chair: **Zareh Soghomonian**, QinetiQ North America

Panelists:

**Yuri Khersonsky**, Consultant 912SG0013, Don't re-invent the "Smart Grid"; use IEEE Standards to make it "Smart")

**Le Tang**, ABB (12SG0109, Smart Grid)

**Narain Hingorani**, Consultant 12SG0106, Future Distribution System)

**James Spaulding**, Eaton Cooperation 912SG0107, Smart Grid Design Synopsis Consideration for the IEEE Power & Energy Society)

**Joshua Hambrick**, National Renewable Energy Laboratory (12SG0105, NREL Smart Grid Projects)

**Power System Islands, Autonomous Microgrids, and Instrumentation** *(panel session)*

**19 January, 03:00 PM – 05:00 PM**

**Thurgood Marshall South**

Chair: **Alberto Borghetti and Lorenzo Peretto**, University of Bologna, Italy

Panelists:

**Geza Joós, McGill University, Subhransu Ranjan Samantaray and Innocent Kamwa, IREQ, Canada** (12SG0029, Differential Energy based Microgrid Protection against Fault conditions)

**Reza Irvani, University of Toronto, Canada** (12SG0041, Fast Islanding Detection and Islanded Operation of Multi-DER Microgrids)

**Alberto Borghetti and Lorenzo Peretto**, University of Bologna, Italy (12SG0419, Power system islands, autonomous microgrids and relevant instrumentation)

**S.S. (Mani) Venkata**, Alstom, USA 12SG0425, Using Advanced Measurement Systems for Microgrid Protection)

## **Coordinated PEV-Grid Operations** (paper session)

19 January, 03:00 PM – 05:00 PM

Thurgood Marshall East

Session Chair: **Lei Wu**, Clarkson University

### **2012ISGT0354, Quantifying the Long-term Power System Benefits of Electric Vehicles**

A. Shortt, University College Dublin, Ireland  
M. O'Malley, University College Dublin, Ireland

### **2012ISGT0284, Impacts of Stochastic Residential Plug-In Electric Vehicle Charging on Distribution Grid**

K.J. Yunus, ABB Corporate Research  
M. Reza, ABB Corporate Research  
H. Parra, ABB Corporate Research  
K. Srivastava, ABB Corporate Research

### **2012ISGT0162, Integration of Plug-In Electric Vehicle Charging and Wind Energy Scheduling on Electricity Grid**

C. T. Li, University of Michigan  
C. Ahn, University of Michigan  
H. Peng, University of Michigan  
J. Sun, University of Michigan

### **2012ISGT0280, Practical Storage and Utilization of Household Photovoltaic Energy by Electric Vehicle Battery**

K. Yoshimi, Waseda University, Japan  
M. Osawa, Waseda University, Japan  
D. Yamashita, Waseda University, Japan  
R. Yokoyama, Waseda University, Japan  
T. Niimura, Hosei University, Japan  
T. Masuda, Nissan Motor, Japan  
H. Kondou, Nissan Motor, Japan  
T. Hirota, Nissan Motor, Japan

### **2012ISGT0331, Control of Battery Electric Vehicle Charging for Commercial Time of Day Demand Rate Payers**

A. Halbleib, University of Louisville  
M. Turner, University of Louisville  
J. Naber, University of Louisville

## **Active Distribution Systems** (paper session)

19 January, 03:00 PM – 05:00 PM

Madison A

Session Chair: **Saeed Kamalinia**, S&C Electric

### **2012ISGT0266, Emergency Reconfiguration and Distribution System Planning under the Single-Contingency Policy**

J. Wang, Massachusetts Institute of Technology, USA  
P. M. S. Carvalho, University of Lisbon, Portugal  
J. Kirtley, Massachusetts Institute of Technology, USA

### **2012ISGT0180, Impact of Smart Grid and Green Power Generation on Distribution Systems**

C. J. Mozina, Beckwith Electric Co

### **2012ISGT0155, Distribution Network Reconfiguration with MILP**

A. Ajaja, Hydro-Québec Distribution, Canada  
F.D. Galiana, McGill University, Canada

### **2012ISGT0302, Model-Based Automated Reconfiguration for Fault Isolation and Restoration**

K. J. Russell, Electrical Distribution Design, Inc  
R. P. Broadwater, Virginia Tech

### **2012ISGT0145, Electric Vehicle Model for Estimating Distribution Transformer Load for Normal and Cold-Load Pickup Conditions**

C. Desbiens, Hydro-Québec Distribution, Canada

### **2012ISGT0196, Impact of Plug-in Hybrid Electric Vehicle Charging on a Distribution Network in a Smart Grid Environment**

S. S. Raghavan, Illinois Institute of Technology  
A. Khaligh, Illinois Institute of Technology

## **Sensor Applications in Smart Grid** (paper session)

19 January, 03:00 PM – 05:00 PM

Madison B

Session Chair: **Tom Prevost**, OMICRON Electronics

### **2012ISGT0338, Analytics for Distributed Smart Grid Sensing**

M. Afzal, Tollgrade Communications  
V. Pothamsetty, Tollgrade Communications

### **2012ISGT0211, A Novel IEC 61850-Based Distribution Line/Cable Protection Scheme Design**

H. Khorashadi Zadeh, Siemens Energy  
M. Manjrekar, Siemens Energy

### **2012ISGT0299, Optical MV Current & Voltage Sensors as a New Generation**

D. Parker, Alabama Power Company, USA  
Y. Harlev, Optisense Networks, USA  
D. Presotto, IMS, Brazil

### **2012ISGT0247, Lighting Control System based on DALI and Wireless Sensor Networks**

F. Domingo-Perez, University of Córdoba, Spain  
A. Gil-de-Castro, University of Córdoba, Spain  
J. M. Flores-Arias, University of Córdoba, Spain  
F. J. Bellido-Outeirino, University of Córdoba, Spain  
A. Moreno-Munoz, University of Córdoba, Spain

**2012ISGT0327, Role of Smart Sensors for Making Smart Grid a Reality**

S. Kora, K.K. Wagh Institute of Engineering Education and Research, India  
P. Malu, K.K. Wagh Institute of Engineering Education and Research, India  
R. Wani, K.K. Wagh Institute of Engineering Education and Research, India

**2012ISGT0256, Fault Location and Self-healing of Distribution network based on Function Block and Wireless Sensor**

B. Duan, Xiangtan University, China  
G. Li, Xiangtan University, China  
C. Qiu, Xiangtan University, China  
J. Pan, Xiangtan University, China  
Y. Tan, Xiangtan University, China

# FRIDAY

## Friday Morning Tutorial Sessions

*20 January, 8:30 AM – 12:00 PM*

Madison A

### Cyber Security of Smart Grid

**Instructor:** Dr. Manimaran Govindarasu, Iowa State University

**Summary:** This tutorial will address the cyber security concerns that accompany smart grid deployments and detail current needs to help mitigate those risks. Specific topics will include security of SCADA, smart metering infrastructures, and initiatives with the NASPInet architecture. Specific attention will address network protocols, trust requirements, and resulting vulnerabilities. Risk management frameworks will also be discussed with a specific characterization of smart grid technologies, including the identification of critical assets, security compliance responsibilities, and risk mitigation techniques.

#### Topics

- Cyber threats, vulnerabilities
- Risk assessment and mitigation
- SCADA security, WAMS/NASPInet security, AMI security
- Cyber-physical system security
- Cyber security testbeds
- Overview of NIST Smart Grid Cyber Security, NERC CIP standards

*20 January, 8:30 AM – 12:00 PM*

Madison B

### Microgrids – Designing Their Role in Smart Grid

**Instructor:** Steven Pullins, President, Horizon Energy

**Summary:** The tutorial introduces the concept and role that Microgrids will play in the evolution of the smart grid. The course material is based on the ongoing implementation of a utility Microgrid and a planned customer-owned Microgrid. Students will be introduced to Microgrid concepts, drivers that influence the Microgrid, as well the projected market for Microgrids. The course will address Microgrid design aspects, engineering considerations, and architectures based on developed use cases. The attendee will leave with an understanding of the key aspects pertaining to designing and implementing a Microgrid.

#### Topics

- The case for microgrids
- Considerations
- Use cases and technical architecture
- Technical Architecture
- Microgrid design
- Microgrid marketplace
- Overview of a customer-owned Microgrid
- Conclusion

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