



IEEE Power & Energy Society
2012 General Meeting
Plenary Session

*New Energy Horizons
Opportunities and Challenges*

Monday, 23 July 2012
Grand Hyatt Manchester
San Diego, California USA



New Energy Horizons Opportunities and Challenges



MODERATOR

Noel N. Schulz, PhD

*President, IEEE Power & Energy Society
Paslay Professor of ECE
Kansas State University*



INTEGRATING NEW TECHNOLOGY AND RENEWABLE
ENERGY TO CREATE A UTILITY OF THE FUTURE

Michael Niggli

*President and Chief Executive Officer,
San Diego Gas & Electric*



A RISK-BASED, STRATEGIC FOCUS TO FURTHER
ENSURE RELIABILITY OF THE BULK POWER SYSTEM

Gerry W. Cauley

*President and Chief Executive Officer
North American Electric Reliability Corporation*



NEED FOR INNOVATION IN THE
POWER INDUSTRY

Arshad Mansoor, PhD

*Senior Vice President for R&D
Electric Power Research Institute*



ADVANCED PLATFORMS FOR
SMART ENERGY COMMUNICATIONS

Kanwalinder Singh, PhD

*Senior Vice President of Business Development
Qualcomm*

New Energy Workforce Keeping Pace with Changing Technology

NOEL N. SCHULZ

With the changes in the power and energy fields over the last decade and looking into the next decade, we will see an evolution of the workforce needs. Smart grid, distributed generation and electric vehicle technologies are bringing in new industries and engineers with much more diverse backgrounds than ever before. Adding to the challenges and opportunities is the fast pace of change within the technical resources in equipment, software and support systems for the power and energy community.

The key to creating the “New Energy Workforce” is creating professional development opportunities for engineers and other professionals from college through retirement. These resources must:

- *educate non-engineers about technical challenges,*
- *capture and transfer lessons learned by senior personnel,*
- *help bridge the gap between different specialties of engineering*
- *encourage women and under-represented groups to pursue careers in this area.*

Dr. Schulz’s talk will highlight how PES is working to develop programs and activities to keep up with the fast pace needs mfor the New Energy Workforce Pipeline.

Dr. Noel Schulz is the Paslay Professor of Electrical and Computer Engineering at Kansas State University. She has a total of over 19 years of teaching experience at five different universities. She received her B.S.E.E. and M.S.E.E. degrees from Virginia Tech and her Ph.D. in EE from the University of Minnesota.

In research and graduate studies, she has been very active having graduated 40 MS and 12 PhD students; published 150 papers and 2 book chapter; and brought in over \$10 M in external research through individual and collaborative projects including an U.S. NSF CAREER award. Her research interests are in the computer applications in power systems including power system operations, shipboard power systems and intelligent system applications

Noel has also been involved in the IEEE Power & Energy Society serving as Secretary from 2004-2007, Treasurer from 2008-2009, President-Elect 2010-11, and President for 2012-2013.

Integrating New Technology and Renewable Energy to Create a Utility of the Future

MICHAEL NIGGLI

The IEEE Power & Energy Society's 2012 General Meeting comes at a transformative moment for the electric grid. No longer a traditional infrastructure system of power lines, poles and substations, the electric grid is becoming a high-tech network known as the "smart grid", which features a broad range of interconnected, inter-operable technologies – including distributed generation, energy storage, wireless sensor networks, software and computing.

The great task at hand for the utility industry is to access the exciting new opportunities inherent in the smart grid, while solving several key operational challenges. For example, we must successfully integrate more intermittent renewable energy, increase the number of electric vehicles in our communities while shifting customer charging habits to off-peak time periods and offer customers new options that leverage the capabilities of smart meters and home area networks. SDG&E is developing real world solutions to these challenges that will fully integrate these new technologies into the system. This smart grid and associated technologies will provide a wealth of benefits for the region, including giving customers the ability to reduce costs, improving energy efficiency, bolstering reliability and enhancing the environment.

As president and chief operating officer of SDG&E, Michael R. Niggli has helped lead the Southern California-based utility to numerous achievements, including launching one of the most ambitious smart grid deployment plans in the nation, overseeing construction of the Sunrise Powerlink transmission line – the utility's largest ever infrastructure project, and securing numerous renewable energy contracts to meet California's clean energy goals. Previously, Niggli served as president of Sempra Generation; was chairman and chief executive officer of Nevada Power Company and Sierra Pacific Resources; and was a senior executive with Entergy Corporation. Niggli holds a bachelor's degree from California State University, Long Beach and a master's degree from San Diego State University, both in electrical engineering.

A Risk-Based, Strategic Focus To Further Ensure Reliability Of The Bulk Power System

GERRY W. CAULEY

2012 is an important year for NERC, the eight Regional Entities, and stakeholders that comprise the Electric Reliability Organization (ERO) Enterprise. The year brings focus and renewed vigor to the management of risks on the bulk power system (BPS). The electric industry continues to face exceptional levels of change with influences from smart grid, reliance on natural gas, variable generation resources, and environmental regulations. The ERO Enterprise works to overcome these increasing challenges by focusing on the robust and integrated analysis of risks as a key to ensuring that efficiency and effectiveness are achieved while further improving the reliability of the BPS. NERC's existing processes and industry data serve as inputs to risk analysis which will result in a consolidated view of risks useful toward initiating targeted reliability risk control efforts.

Since January 2010, Gerry W. Cauley has served as President and Chief Executive Officer of the North American Electric Reliability Corporation (NERC) and remains responsible for overseeing NERC's mission to ensure the reliability of the North American bulk power system. Mr. Cauley leads key programs affecting more than 1,900 bulk power system owners, operators, and users, including standards and training, critical infrastructure, risk analysis, compliance monitoring, enforcement, situation awareness, reliability assessment, and government relations. Mr. Cauley also oversees the operation of eight regional entities engaged in implementation of delegated responsibilities.

Mr. Cauley has also served as President and Chief Executive Officer of the SERC Reliability Corporation; Vice President and Director of Standards at NERC; program manager of grid operations and planning at the Electric Power Research Institute; and training consultant for electric system operations, nuclear and fossil plant operations, substations, and distribution. He also served as an officer in the U.S. Army Corps of Engineers.

Mr. Cauley has a bachelor's degree from the U.S. Military Academy at West Point, a master's degree from the University of Maryland in nuclear engineering, and a master's degree in business administration from Loyola College - Baltimore. He is a registered Professional Engineer in the Commonwealth of Virginia.

Need for Innovation in the Power Industry

ARSHAD MONSOOR

The Electrical Grid was selected as the greatest engineering achievement of the 20th century by the National Academy of Engineering. From the very early stages innovation led by pioneers such as Edison, Steinmetz, Westinghouse and Tesla resulted in the development of a train of technologies such as batteries, motors, capacitors, inductors, generators and transformers to create what we know as the Electrical Grid. However we cannot rest on the laurels of past glory. The electricity industry will likely see more changes in the next ten years than it has in the past hundred. Innovation will assure our ability to provide society with affordable, reliable and environmentally responsible electricity. At Electric Power Research Institute, EPRI, we are working collaboratively with the industry to shape the future of electricity through innovation.

Arshad Mansoor is Senior Vice President, Research and Development for the Electric Power Research Institute (EPRI), with executive responsibility for EPRI's portfolio of research, development and demonstration programs, spanning renewable, fossil, and nuclear generation; power delivery and utilization; and the environment. Previously he served as Vice President of EPRI's Power Delivery and Utilization sector where he led research, development, demonstration, and application of transmission and distribution and energy utilization technologies; as Vice President of the former EPRI subsidiary, EPRI Solutions; and as Vice President and Director of Engineering with the EPRI Power Electronics Application Center.

Mansoor has a strong technical background in power systems engineering with 17 years of experience in consulting and R&D related to the electricity industry. He earned a Bachelor of Science in electrical engineering from the Bangladesh University of Engineering and Technology and Master of Science (1992) and doctorate (1994) in electrical engineering focusing on power systems engineering from the University of Texas in Austin. He holds three U.S. patents in the area of power transformers and energy storage.

Mansoor is a senior member of the Institute of Electrical & Electronics Engineering, Inc. and Vice President of U.S. National Committee (USNC) of CIGRE, an International Council on Large Electric Systems.

Advanced Platforms for Smart Energy Communications

KANWALINDER SINGH

The same advanced communications platforms powering billions of portable devices now enable utilities to reliably, securely and cost-effectively deploy smarter grids. Cellular networks provide the ubiquitous coverage, high bandwidth and real-time communications that enable critical smart grid functionality. Within the home, short range communication technologies like HomePlug GreenPHY and low energy Wi-Fi provide high performance and reliable connectivity in an energy efficient manner. The combination of these technologies empowers utilities with the foundation to deploy a broad array of smart energy applications.

Kanwalinder Singh is senior vice president of business development, new markets for Qualcomm CDMA Technologies (QCT). He leads QCT's New Markets organization and is responsible for driving Qualcomm's chipset business in the "machine-to-machine" (M2M) space, with focus on Smart Automotive and Smart Energy domains. Singh is responsible for the QCT New Market's strategy, relationships and business development, solutions development with Qualcomm's chipset customers and partners as well as chipset and reference design roadmaps.

Singh joined Qualcomm in 2004 as president, Qualcomm India and South Asia. He was instrumental in bringing a focus on emerging markets to enable affordable sub-\$20 CDMA handsets and sub-\$25 EV-DO/HSPA wireless broadband devices. 3G auctions in India, which led to WCDMA/HSPA deployments in 2010, was a highlight during his tenure. Under Singh's leadership, Qualcomm made a winning bid in India's BWA auction in 2010 to secure top markets including Delhi and Mumbai, and established LTE TDD as the compatible roadmap for EVDO and HSPA operators in India. He extended Qualcomm's partnerships beyond operators to the Open Market and private brands in India, and championed commercialization of the CDMA Open Market Handset (OMH) initiative.

Between 2000 and 2004, Singh was chief technical officer with Lucent Technologies India Ltd. Prior to that, he held various technical and managerial positions in Bell Laboratories and product units over an 11-year tenure at Lucent Technologies.

Singh completed a masters degree in electrical engineering from Bucknell University, Pennsylvania, USA and Ph.D. coursework in computer and systems engineering at Rensselaer Polytechnic Institute, New York. He is a graduate of the Executive Development Program at Wharton School of Business, Pennsylvania.



Power & Energy Society®

IEEE Power & Energy Society

445 Hoes Lane

Piscataway, NJ 08854 USA

pes@ieee.org

www.ieee-pes.org