2014 PROGRAM COMMITTEE

Kenneth R. Brand,
Manager
Distribution Operations Services
Public Service Company of Oklahoma
Tulsa, Oklahoma
Stephen Condren
Manager, Protection Coordination Engineering
OG&E Electric Services
Oklahoma City, Oklahoma
David Osburn
Assistant General Manager
Oklahoma Municipal Power Authority
Edmond, Oklahoma

2014 EXECUTIVE COMMITTEE
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Distribution Operations Services
Public Service Company of Oklahoma
Tulsa, Oklahoma
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Oklahoma Municipal Power Authority
Edmond, Oklahoma
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Engineering Energy Laboratory
Regents and PSO/Naeter Professor of Electrical & Computer Engineering
Oklahoma State University
Stillwater, Oklahoma
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Managing Director Generation Planning & Control
OGE Energy Corporation
Oklahoma City, Oklahoma.

2014 SPONSORS
Grand River Dam Authority, Luncheon
Lauren Engineers and Constructors, Conference Venue
Siemens Energy, Banquet

47th Annual
Frontiers of Power Conference

October 27-28, 2014
Conoco/Phillips OSU Alumni Center

47 Years of Serving the
Oklahoma and Regional Power Industry

Co-Sponsored by
The Engineering Energy Laboratory and The School of Electrical and Computer Engineering, Oklahoma State University

Conference Arrangements by
The Engineering Energy Laboratory
216 Engineering South
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Stillwater, Oklahoma 74078-5034

An Oklahoma State University Outreach Program

2014
47th Annual
Frontiers of Power Conference

ABOUT THE CONFERENCE

The frontiers of power technologies have been expanding dramatically in recent years. This is due to concerns over environmental impacts, entry of renewable energy technologies, security issues, power quality needs to satisfy the evolving digital society and the opportunities that have opened up to embed sensors, computers and two-way communications that utilize the internet to evolve a smart grid. The variety of papers and the Keynote Speakers scheduled in this 47th annual conference reflect these changing times and provide an opportunity for free and open discussion of important issues with serious economic implications.

KEYNOTE SPEAKER

Mladen Kezunovic, Ph.D., P.E., Fellow, IEEE, Fellow, CIGRE
Eugene E. Webb Professor,
Director, Smart Grid Center
Site Director, NSF Power Systems Engineering Research Center
Director, Power Systems Control and Protection Lab
Texas A&M University
College Station, Texas

KEYNOTE SPEAKER

S. Massoud Amin, D.Sc., Fellow, ASME
Honeywell/H. W. Sweatt Chair
Director, Technological Leadership Institute
Professor of Electrical and Computer Engineering
University Distinguished Teaching Professor
University of Minnesota
Twin Cities Campus
Minneapolis, Minnesota

KEYNOTE SPEAKER

Bruce Rising, Member, ASME
Association for the Advancement of Science
American Chemical Society and
National Association of Corrosion Engineers
Strategic Business Manager
Power Systems Sales
Siemens Energy, Inc.
Orlando, Florida

The Frontiers of Power Conference seeks to provide for the frank and open discussion of current problems facing the electric utility industry. Over the years, the scope of this conference has expanded to include several critical problem areas of energy and power technologies. These problems are not only technical but political and economic as well.

Engineers, engineering managers, and supervisors associated with planning, designing, or operating power generating stations and transmission and distribution systems and renewable energy projects will find this program of special relevance to their work.

Participation is invited from all those associated with electric utilities, electric power production facilities, power equipment manufacturers, consultants for municipal and rural electric utilities, universities, and government agencies.

This Forty-seventh Annual Conference is a continuation of a program first started in the early 1960's at Oklahoma State University, Stillwater.

Predictive Routing Model for Communication Between EV Users and Highway Charging Station and Calculation of Power Demand

Ketan Paithankar
CTO, Co-founder
Erudite Systems
Nagpur, India
Sachin G. Argade
Ph.D. Candidate
Wichita State University
Wichita, Kansas

Development of Renewable Energy Based Common DC Micro Grid with Possible Energy Sharing for Residential Applications

S.R. Sivarasu,
E. Chandira Sekaran, Ph.D.
S. Vasantharahna, Ph.D.
P. Karthik
Project Fellow
Coimbatore Institute of Technology
Coimbatore, Tamil Nadu, India

Presented by Title Only

A Pragmatic Approach for Improving Energy Efficiency and Reduction Of Specific Energy Consumption in Industries

K Suresh
Assistant Professor
Devi Shree, Ph.D.
Assistant Professor
Electrical and Electronics Engineering
Coimbatore Institute of Technology
Coimbatore, Tamil Nadu, India

Effect of Partial Shading Conditions in PV Arrays Using Flipped H, Circular Rotation, Up-Down and Inverted Triangle Methods

R. L. Josephine
Ph.D. Candidate
S. Suja, Ph.D.
Assistant Professor
G. Karunambika
Coimbatore Institute of Technology
Coimbatore, Tamil Nadu, India

12:30 Adjourn

Monday, October 27, 2014

8:00 Registration & Continental Breakfast
Conoco/Phillips OSU Alumni Center
Jones Conference Room

9:00 Conference Opening—Jones Conference Room
Introduction and Welcome
Rama Ramakumar. Ph.D.
Conference Director
Regents Professor and
PSO/Albrecht Naeter Professor
Director, Engineering Energy Laboratory
James C. West, Ph.D.
Professor and Interim Head
School of Electrical and Computer Engineering
Charles Bunting
Halliburton Professor of Engineering
Associate Dean for Research
College of Engineering, Architecture and Technology
Oklahoma State University

9:30 KEYNOTE PRESENTATION
Big Data: What, Why, When and How
Mladen Kezunovic, Ph.D., P.E., Fellow, IEEE, Fellow, CIGRE
Eugene E. Webb Professor,
Director, Smart Grid Center
Site Director, NSF Power Systems Engineering Research Center
Director, Power Systems Control and Protection Lab
Texas A&M University
College Station, Texas

10:30 Break

10:45 KEYNOTE PRESENTATION
TBD
S. Massoud Amin, D.Sc., Fellow, ASME
Honeywell/H. W. Sweatt Chair
Director, Technological Leadership Institute
Professor of Electrical and Computer Engineering
University Distinguished Teaching Professor
University of Minnesota
Minneapolis, Minnesota

11:45 GRDA Luncheon
Click Alumni Hall

12:30 KEYNOTE PRESENTATION

The North American Power Industry: The Next Century

Bruce Rising, Member, ASME
Association for the Advancement of Science
American Chemical Society and
National Association of Corrosion Engineers
Strategic Business Manager
Power Systems Sales
Siemens Energy, Inc.
Orlando, Florida

1:30 Technical Paper Session

Moderator: Edwin "Bud" Averill
Project Engineer-Relay
Grand River Dam Authority
Pryor, Oklahoma

Demand Response to Mitigate Variability in Solar Photovoltaic Generation

Ward Jewell, Ph.D., Fellow, IEEE
Professor
Site Director NSF Power Systems Engineering Research Center
Electrical and Computer Engineering
Wichita State University
Wichita, Kansas

Community Energy Storage-Enabling High Penetrations of Small, Distributed Solar Generators

Tom Walker, P.E.
Senior Engineer
Stratigic Solutions/Grid Network Control
S&C Electric Company
Chicago, Illinois

10:30 Technical Paper Session

Moderator Stephen Condren
Manager, Protection Coordination Engineering
OG&E
Oklahoma City, Oklahoma

Electrical Ignition Demystified

Robert A. Durham, Ph.D., P.E.
Principal Analyst
Jason A. Coffin, MBA, CFEL, PI
Senior Scientist
Marcus O. Durham, Ph.D., Th.D.
Senior Principal Analyst
THEWAY Labs
Bixby, Oklahoma

Smart Power Generation to Support Growth in Renewable Energy

Dan Shelledy, P.E.
Business Development Manager
Power Plant Sales
Wartsila North America, Inc.
Houston, Texas

Enhanced Stability of Renewable Energy Resources Through The Implementation of a Droop Control Scheme Using Synchrophasors via LQI Control

Mahmood Saadeh
Ph.D. Candidate
Roy McCann, Ph.D.
Professor
University of Arkansas
Fayetteville, Arkansas

Increasing Penetration of Wind Energy Through Power System Stability Improvements Using Series Static Synchronous Compensators

Mahmood Saadeh
Ph.D. Candidate
Andrew Dodson
Graduate Student
Roy McCann, Ph.D.
Professor
University of Arkansas
Fayetteville, Arkansas

Design and Implementation of Three-Phase Bidirectional DC-DC Dual Active Bridge Using SiC MOSFET

Tariq Aldawsari
Graduate Student
Roy McCann, Ph.D.
Professor, Electrical and Computer Engineering
Chris Marts
Graduate Student
University of Arkansas
Fayetteville, Arkansas

Improved Time-of-Use Pricing Scheme for a Battery Energy Storage System with Renewable Energy Resources

Kirsch Mackey
Graduate Assistant
Roy McCann, Ph.D.
University of Arkansas
Fayetteville, Arkansas

Creation of a Low-voltage Dual-active Bridge DC-DC Converter for the Evaluation of a Vanadium-redox Flow Battery

Chris Marts
Graduate Student
Roy McCann, Ph.D.
Tariq Aldawsari
University of Arkansas
Fayetteville, Arkansas

Application of Demand Response and Residential Energy Efficiency Without Compromising Consumer Comfort

Saurav Basnet
Ph.D. Candidate
Ward Jewell, Ph.D.
Abbas Gholizadeh
Graduate Student
Electrical and Computer Engineering
Wichita State University
Wichita, Kansas

10:15 Break

Impact Study: High Penetration Residential Solar PVS

Aaron D. Jenkins
Recent Graduate
Abbas Gholizadeh
Graduate Research Assistant
Visvakumar Aravinthan, Ph.D.
Assistant Professor
Wichita State University
Wichita, Kansas

2:30 Break

2:45 Technical Paper Session

Moderator: Travis Hyde
Director
Transmission & Distribution Planning and Control
OG&E
Oklahoma City, Oklahoma

Load Characteristics and their Dynamic Impact in DC Micro-grids under Game Theoretic Transient Control

Nishantha C. Ekneligoda, Ph.D.
Assistant Professor
Electrical and Computer Engineering
Oklahoma State University
Stillwater, Oklahoma

Application of Automated Planning and Testing Tool For System Restoration

Chenxi Lin, Ph.D.
System Architect
Xiaosong Yang
Director of Business Development
Eleon Energy Inc.
Austin, Texas

A Robust Optimization Approach to Microgrid Energy Management with Renewables

Yuanxiong (Richard) Guo, Ph.D.
Assistant Professor
Electrical and Computer Engineering
Oklahoma State University
Stillwater, Oklahoma

Implementation of Electrode Boilers for Load-Frequency Control of Utility Grids

Huibert Antonie (Ton) Verra
Ph.D. Candidate
(John) Ning Jiang, Ph.D.
OG&E Professor
Director, Electric Energy Risk Laboratory
John Dyer, Ph.D.
Research Assistant Professor
Director, Navigation Research Laboratory
Jacob Henderson
Ph.D. Candidate
Electrical and Computer Engineering
The University of Oklahoma
Norman, Oklahoma

Service Capabilities and Improvements to Keep Fossil-Fired Power Plants Operating in Today's Regulatory and Competitive Environment

Michael W. Smiarowski
Manager, Steam Product Line
Adi Srinivasan
Manager, Strategy and Development
Siemens Energy, Inc.
Orlando, Florida

Design and Development of Grid Complimentary Transformerless Standalone PV Systems forAdministrative and Commercial Buildings

E. Chandira Sekaran, Ph.D.
Associate Professor
R. Prabhakar, Ph.D.
Professor and Principal Emeritus
V. Selladurai, Ph.D.
Principal
S. Vasantharathna, Ph.D.
Professor and Head
S.R. Sivarasu
Ph.D. Candidate, Assistant Professor
Coimbatore Institute of Technology
Coimbatore, Tamil Nadu, India
A. Sashankan
Graduate Engineer Trainee
Chrysler India Automotive Private Limited
Chennai, India

4:45 Adjourn

7:00 Siemens Energy Banquet
Freddie Paul's Steakhouse
1707 E. 6th Avenue (Highway 51)
Map online at: www.freddiepauls.com

Tuesday, October 28, 2014

8:00 Convene-Continental Breakfast,
Conoco-Phillips OSU Alumni Center
Jones Conference Room

8:15 Technical Paper Session
Moderator Kenneth R. Brand
Manager
Distribution Operations Services
Public Service Company of Oklahoma
Tulsa, Oklahoma

Simulation of Renewable Energy Integration in Smart Grids Using GridLAB-D Platform

S. Kancherla
Graduate Student
R. Ramakumar, Ph.D.
Regents Professor
PSO/Albrecht Naeter Professor
Director, Engineering Energy Laboratory
Electrical and Computer Engineering
Oklahoma State University
Stillwater, Oklahoma

Optimal Sizing for Integrated Renewable Energy Systems (IRES) Based on LPSP Using Genetic Algorithm (GA)

Zeel Maheshwari
Ph.D. Candidate
R. Ramakumar, Ph.D.
Electrical and Computer Engineering
Oklahoma State University

Dynamic Security Assessment of Power Systems Using Machine Learning Techniques

Navin Shenoy
Ph.D. Candidate
R. Ramakumar, Ph.D.
Electrical and Computer Engineering
Oklahoma State University