



# Power Systems Engineering Research Center

## PSERC Resources

This document serves as a platform for reaching a range of information resources provided by PSERC. Links in the document will bring that information to you via the Internet. Whenever you see words in blue letters, click on them and you will be linked to the information you are seeking. The links will take you to documents on the [PSERC web site](#).

Sometimes a link will take you to a folder on the web site rather than to a particular document. In this way, you will be able to see any additional documents that were added to the folder after this document was created. Also, the folders often contain abstracts. Of course, you will need to connect to the Internet to access the folders and documents. Most of the documents listed here can be viewed without logging into the web site. Use of the latest version of the [Adobe Acrobat viewer](#) is recommended. If you have any questions about accessing the documents or about PSERC in general, please contact Dennis Ray, Executive Director, at 608-265-3808 or [djray@engr.wisc.edu](mailto:djray@engr.wisc.edu).

### Table of Contents (click below on any title of interest)

Title	Page
Introducing PSERC.....	1
Reports .....	14
2008 Publications.....	23
2007 Publications.....	25
2006 Publications.....	28
2005 Publications.....	33
2004 Publications.....	39
2003 Publications.....	44
2002 Publications.....	48
2001 Publications.....	54
2000 Publications.....	59
1999 Publications.....	63
1998 Publications.....	65
1997 Publications.....	69
Resources for Understanding Power Systems and Blackouts.....	72
Presentations by PSERC Researchers.....	73
PSERC Research Tele-Seminar Slides 2006-2008.....	75
PSERC Research Tele-Seminar Slides 2000-2005.....	78
PSERC Research Seminar Audio-Slide Productions 2006-2008 .....	84
PSERC Research Seminar Audio-Slide Productions 2003-2005 .....	88
Markets Reports and Selected Publications .....	92
Systems Reports and Selected Publications.....	105
T&D Technologies Reports and Selected Publications .....	129
Tools and Additional Resources .....	140

## **Introducing PSERC**

The electric power industry is evolving from its historical business structure. Challenges for success in this demanding business environment are being raised by new market structures and ways of doing business, new technologies, the demands of customers for customized services, strategic choices between centralized and decentralized technologies, institutional changes creating mega-RTOs, a graying industry that needs well-trained power engineers, and new environmental priorities. Yet the basic function of the industry – to produce and to deliver power, safely and reliably – has not changed. The challenges call for new strategies, technologies, analytical capabilities and tools, and operating practices, along with sound public policy guidance.

The Power Systems Engineering Research Center (PSERC) draws on university capabilities to creatively address these challenges. Its core purpose is to:

***Empower Minds to Engineer the Future Electric Energy System.***

Under the banner of PSERC, multiple U.S. universities are working collaboratively toward:

- An efficient, secure, resilient, adaptable, and economic electric power infrastructure serving society
- A new generation of educated technical professionals in electric power
- Knowledgeable decision-makers on critical energy policy issues
- Sustained, quality university programs in electric power engineering.

PSERC provides:

- efficient access to experienced university researchers in an array of relevant disciplines and geographically located across the U.S.
- leading-edge research in cost-effective projects jointly developed by industry leaders and university experts
- high quality education of future power engineers.

The multidisciplinary expertise of PSERC's researchers includes power systems, applied mathematics, complex systems, computing, control theory, power electronics, operations research, non-linear systems, economics, industrial organization and public policy. PSERC partners with private and public organizations that provide integrated energy services, transmission and distribution services, power system planning, control and oversight, market management services, and public policy development.

Additional information about PSERC and a [calendar](#) of PSERC activities can be found at its web site, <http://www.pserc.org>.

## ***Education Program***

The undergraduate and graduate power programs at PSERC's collaborating universities produce engineers capable of making substantive contributions in today's complex power industry. By taking innovative research findings to the classroom and involving students in our research, PSERC faculty introduce students to the cutting edge of power system technologies, analytical techniques and industry practices. Not only does PSERC help students become technically prepared for their next job, it also assures that they will be knowledgeable about the challenges and trends transforming the industry. PSERC also facilitates efficient employment searches through industry-student interactions at industry meetings, student involvement in PSERC projects, web site postings, and email announcements. Available student resumes and profiles for PSERC members can be found in the web site folder [Student Profiles and Resumes](#) (log-in required for viewing).

PSERC's education program also includes professional development. Through short courses, monthly Internet seminars, and on-site seminars, PSERC meets continuing education needs of engineers from our industrial partners. The PSERC website has tutorials, analysis tools and recorded seminars along with papers, reports and presentations by its researchers.

### **What are job interests of our undergraduate and graduate students? We asked them.**

- Power system analysis
- Ancillary services, available transfer capability, congestion management, control systems
- Distribution systems, microgrids, substations, transformers, underground cables, sensors, automation
- Communications technologies, fiber opticsGeneration, distributed generation, renewables, custom power
- Computational techniques, simulation, software agents
- Graphics and visualization
- Intelligent systems, artificial intelligence, genetic algorithms
- Dynamics, stability, EMTP applications and modeling, security assessment, voltage collapse, state estimationEconomics and finance, markets and market design, deregulation, bidding, options, load forecasting, pricing, risk assessment and management
- Electric machinery, motors
- Operations, planning, maintenance strategies, energy management
- Power electronics, digital signal processing, robotics
- Power quality, reliability, voltage quality
- Protection systems, relay coordination, fault analysisTransmission, high voltage engineering

## ***Research Program***

Industry restructuring and technology change is creating new challenges for the operations, security and reliability of the power system, for the physical and institutional structures, and for delivery of economical and environmentally acceptable electricity services. PSERC's research focus is on helping the next generation electric power system evolve into a competitive, high-performance component of the nation's infrastructure. Its research program is divided into three research stems.

### **Markets Research Stem**

The electric power industry is in transition toward a market-oriented structure with decentralized decision-making by a wide-ranging group of market participants. The research under this stem emphasizes the design and analysis of market mechanisms, computational tools and institutions that facilitate efficient coordination, investment and operations while recognizing the economic and technical characteristics of power systems. Markets research examines market design, verification and validation within the context of electricity market restructuring. Representative research topics are active load participation, auction policies and strategies, market mechanisms, restructured market assessment and transmission asset valuation. Markets research includes experimental methods to test and verify the performance of alternative market designs.

[PowerWeb](#) is an Internet-based simulation developed for experiments and education on power markets.

### **Transmission and Distribution Technologies Research Stem**

The transmission and distribution technologies research stem addresses issues related to moving electrical energy efficiently, safely, securely and reliably. This stem is divided into areas associated with higher voltage levels (transmission systems) and lower voltage levels (distribution systems). Improvements in this infrastructure could be achieved through innovations in software, hardware, materials, sensors, communications and operating strategies. Therefore, a central goal of this research stem is the improvement of transmission and distribution systems through the application of technological advances. Representative research topics are automation, intelligent devices and control concepts, management of an aging infrastructure, protection systems, stability and dynamic limits, substation data integration and functionality, and state estimation.

### **Systems Research**

Restructuring is leading to large and complex operational entities (such as Independent System Operators or Regional Transmission Organizations) while small-scale, dispersed generation technologies are increasing their penetration in power systems. The challenge is to develop new operations frameworks and approaches that will effectively cope with the growing complexity of a restructured industry. Systems research seeks ways to increase use, efficiency and reliability of increasingly complex and dynamic power systems. Representative research topics are cascading events, complex systems, computational methods for large systems, control schemes, distribution system reliability, risk assessment, security assessment, transfer limits and visualization.

## **Research Stem Committees**

Each research stem has a committee that organizes the research activities of that stem. Industrial members join researchers on the committees. The current stem committee chairs and vice-chairs (respectively) are:

- Markets: [Richard Schuler](#), Cornell University, and [Mark Sanford](#), GE Energy.
- Transmission and Distribution Technologies: [Gerald Heydt](#), Arizona State University, and [Robert Saint](#), National Rural Electric Cooperative Association.
- Systems: [James McCalley](#), Iowa State University, and [Mahendra Patel](#), PJM Interconnection.

## **Projects**

To obtain information about the research projects in the three stems click on [Research Program and Project Descriptions](#). Titles of current and completed projects are given below.

### ***Markets Research Projects***

Markets research focuses on market design, verification and validation along with reliability, auctions, asset valuation, market power and decision-making tools.

**Current Projects** (projects in red are proposals for new projects in 2009; projects in green began in 2008; remaining projects are about to be completed)

- [Coupling Wind Generation with Controllable Load and Storage: A Time-Series Application of the SuperOPF](#)
- [PHEVs as Dynamically Configurable Dispersed Energy Storage](#)
- Technical and Economic Implications of Greenhouse Gas Regulation in a Transmission Constrained Restructured Electricity Market (M-21)
- Facilitating Environmental Initiatives While Maintaining Efficient Markets and Electric System Reliability (M-20)
- Improved Investment and Market Performance Resulting from Proper Integrated System Planning (M-18)
- Integrated Financial and Operational Risk Management in Restructured Electricity Markets (M-17)
- Economic Impact Assessment of Transmission Enhancement Projects (M-14)
- Integrating Electric System Planning with Efficient Markets to Provide Adequate Investment (M-16)
- Optimal Electricity Market Structures to Reduce Seams and Enhance Investment (M-9)

**Completed Projects** (titles are linked to the final reports on the PSERC website)

- [Agent Modeling for Integrated Power System, Power and Fuel Market Simulation](#) (2008)
- [Electric Power Industry and Climate Change – Discussion Paper](#) (2007)
- [Evaluation of Alternative Market Structure and Compensation Schemes for Incenting Transmission Reliability and Adequacy Related Investments](#) (M-11)

- Market Interactions and Market Power (2003)
- Market Mechanisms for Competitive Electricity (2002)
- Market Redesign: Incorporating the Lessons Learned from Actual Experiences for Enhancing Market Design (2005)
- Modeling Market Signals for Transmission Adequacy Issues: Valuation of Transmission Facilities and Load Participation Contracts in Restructured Electric Power Systems (2007)
- Reactive Power Support Services in Electricity Markets (2000)
- Reliability Assessment Incorporating Operational Considerations and Economic Aspects for Large Interconnected Grids (2007)
- Reliability, Electric Power, and Public Vs. Private Goods: A New Look at the Role of Markets (2008)
- Software Agents for Market Design and Analysis (2005)
- Structuring Electricity Markets for Demand Responsiveness: Experiments on Efficiency and Operational Consequences (2004)
- Tools for Assessment of Bidding into Electricity Auctions (2008)
- Uncertain Power Flows and Transmission Expansion Planning (2007)

### ***Systems Research Projects***

Systems research concentrates on efficient and reliable operation of the increasingly complex and dynamic power system.

**Current Projects** (projects in red are proposals for new projects in 2009; projects in green began in 2008; remaining projects are about to be completed)

- Next Generation On-Line Dynamic Security Assessment
- Toward a Systematic Framework for Deploying Synchrophasors and their Utilization for Improving Performance of Future Electric Energy Systems
- Special Protection Schemes: Limitations, Risks, and Management(S-35)
- Using PMU Data to Increase Situational Awareness (S-36)
- Development and Evaluation of System Restoration Strategies from a Blackout (S-30)
- Fast Simulation, Monitoring, and Mitigation of Cascading Failures (S-32)
- Impact of Increased DFIG Wind Penetration on Power System Reliability and Consequent Market Adjustments (S-34)
- Implementation Issues for Hierarchical, Distributed State Estimators (S-33)
- Real-Time Security Assessment of Angle Stability and Voltage Stability Using Synchrophasors (S-31)
- Techniques for the Evaluation of Parametric Variation in Time-Step Simulations (S-17)

**Completed Systems Stem Projects** (titles are linked to the final reports on the PSERC website)

- [Automated Operating Procedures for Transfer Limits](#) (2001)
- [Avoiding and Suppressing Oscillations](#) (2000)
- [Comprehensive Power System Reliability Assessment](#) (2005)
- [Coordination of Line Transfer Capability Ratings](#) (2002)
- Detection, Prevention and Mitigation of Cascading Events: [Part I](#), [Part II](#), [Part III](#) (2005)
- [Detection, Prevention and Mitigation of Cascading Events – Prototype Implementations](#) (2008 – For members only)
- [Effective Power System Control Center Visualization](#) (2008)
- [Enhanced State Estimators](#) (2006)
- [Extended State Estimation for Synchronous Generator Parameters](#) (2005)
- [Identification and Tracking of Parameters for a Large Synchronous Generator](#) (2002)
- [Impact of Protection Systems on Reliability](#) (2001)
- [Integrated Security Analysis](#) (2003)
- [New Implications of Power System Fault Current Limits](#) (2005)
- [New System Control Methodologies](#) (2005)
- [On-Line Transient Stability Assessment](#) (2005)
- [Optimal Allocation of Static and Dynamic VAR Resources](#) (2008)
- [Optimal Placement of Phasor Measurement Units for State Estimation](#) (2005)
- [Power System State Estimation and Optimal Measurement Placement for Distributed Multi-Utility Operation](#) (2002)
- Preventing Voltage Collapse with Protection Systems that Incorporate Optimal Reactive Power Control (2008 – For members only)
- [Risk of Cascading Outages](#) (2008)
- [Risk-Based Maintenance Allocation and Scheduling for Bulk Transmission System Equipment](#) (2003)
- [Robust Control of Large-Scale Power Systems](#) (2002)
- Security Enhancement through Direct Non-Disruptive Load Control: [Part I](#), [Part II](#) (2006)
- [Steady State Voltage Security Margin Assessment](#) (2002)
- [A Tool for On-Line Stability Determination and Control for Coordinated Operating between Regional Entities Using PMUs](#) (2008)
- [Visualization of Power Systems, and Components](#) (2005)
- [Voltage Collapse Margin Monitor](#) (2001)

## **T&D Technologies Research Projects**

T&D research improves transmission and distribution systems through use of technology innovations.

**Current Projects** (projects in red are proposals for new projects in 2009; projects in green began in 2008; remaining projects are about to be completed)

- Communication Requirements and Integration Options for Smart Grid Deployment
- Implications of the Smart Grid Initiative on Distribution Engineering
- PHEVs as Dynamically Configurable Dispersed Energy Storage
- The 21st Century Substation Design (T-37)
- Substation of the Future: A Feasibility Study (T-38)
- Characterization of Composite Cores for High Temperature-Low Sag Conductors (T-33)
- Comparative Characterization of Parallel Distribution Sensors Under Field Conditions (T-35)
- Integration of Asset and Outage Management Tasks for Distribution Applications (T-36)
- Overloading and Optimum Operation of Liquid Filled Power Transformers (T-25)
- Power System Level Impacts of Plug-In Hybrid Cars (T-34)

**Completed T&D Projects** (titles are linked to the final reports on the PSERC website)

- Accurate Fault Location in Transmission and Distribution Networks Using Modeling, Simulation and Limited Field-Recorded Data (2002)
- Automated Integration of Condition Monitoring with an Optimized Maintenance Scheduler for Circuit Breakers and Power Transformers (2006)
- Condition Monitoring and Maintenance Strategies for In-Service Non-ceramic Insulators, Underground Cables and Transformers (2002)
- Control and Design of Microgrid Components (2006)
- Corona Discharge Caused Deterioration of All Dielectric Self-Supporting Fiber-Optic Cables (2002)
- Differential GPS Measurement of Overhead Conductor Sag and Software Implementation (2002)
- Digital Protection System Using Optical Instrument Transformers and Digital Relays Interconnected by an IEC 61850-9.2 Digital Process Bus (2008)
- Distributed Electric Energy Storage and Generation (2004)
- Distribution System Electromagnetic Modeling and Design for Enhanced Power Quality (2005)
- Electrical Transmission Line Insulator Flashover Predictor (2001)
- Enhanced Reliability of Power System Operation Using Advanced Algorithms and IEDs for On-Line Monitoring: [Part I](#), [Part II](#) (2005)

- Enhanced State Estimation via Advanced Substation Monitoring (2002)
- Evaluation of Critical Components of Non-Ceramic Insulators In-Service: Role of Seals and Interfaces (2004)
- Integration of Substation IED Information into EMS Functionality (2008)
- Intelligent Substation (2004)
- Investigation of Fuel Cell Operation and Interaction within the Surrounding Network (2002)
- Massively Deployed Sensors (2008)
- Novel Approach for Prioritizing Maintenance of Underground Cables (2006)
- On-Line Peak Loading of Substation Distribution Transformers Through Accurate Temperature Prediction (2001)
- Performance Assessment of Advanced Digital Measurement and Protection Systems: [Part I](#), [Part II](#) (2006)
- Personnel Grounding and Safety Issues / Solutions Related to Servicing Telecommunications Equipment Connected to Fiber Optic Cables in Optical Ground Wire (OPGW) (2002)
- Power System Monitoring Using Wireless Substation and System-Wide Communications: [Part I](#), [Part II](#) (2002)
- Prediction of Flashover Voltage of Insulators Using Low Voltage Surface Resistance Measurement (2006)
- Redesign and New Interpretation of Power Acceptability Curves for Three Phase Loads (2001)
- Reliability-Based Vegetation Management Through Intelligent System Monitoring (2007)
- Risk-Based Maintenance Resource Allocation for Distribution System Reliability Enhancement (2006)
- Satellite Imagery for the Identification of Interference with Overhead Power Lines (2008)
- Smart Sensor Development for Power Transmission and Distribution (2004)
- Transient Testing of Protective Relays: Study of Benefits and Methodology (2008)
- Voltage Sag Effect on Loads in Electric Power Systems (2005)

## **Leveraged Research Projects**

Industrial members' support is leveraged into other research initiatives, such as:

- Consortium for Electric Reliability Technology Solutions (**CERTS**), formed in 1998 to research, develop and commercialize new methods, tools and technologies to protect and enhance the reliability of the U.S. electric power system under the emerging competitive electricity market structure. CERTS is conducting research for the U.S. Department of Energy's Transmission Reliability Program and for the California Energy Commission's Public Interest Energy Research program. PSERC faculty are working with researchers at Lawrence Berkeley National Laboratory, Oak Ridge National Laboratory, Pacific Northwest National Laboratory, Sandia National Laboratories and Southern California Edison. In a current CERTS effort, several PSERC researchers are on the technical team advising the US DOE in its study of elements of the Administration's National Energy Policy related to transmission.
- By working with industry under the NSF Research Centers - Small Firms Collaborative R&D initiative, and with funding and advice from industrial members of PSERC, PSERC researchers formed a research team to develop more accurate ways to compute the maximum power that can be transferred in power systems and to quickly estimate how this maximum power can be increased by adjusting power system controls. The researchers are providing participants in power markets with information on technological developments and knowledge to better understand limits to power transfers in power systems. An interactive calculator and tutorial available on the web at <http://www.pserc.cornell.edu/tcc/>.

## ***Universities***

The Director of PSERC is Vijay Vittal who is at Arizona State University. The Director is responsible for overseeing all affairs of PSERC. The Executive Director, Dennis Ray, assists the Director in industry relations and Center management. The Site Directors are PSERC's local campus representatives and liaison to the university faculty, staff, and administration. The Director and Site Directors comprise PSERC's Executive Committee.

PSERC's collaborating universities provide the leadership and technical capability necessary to address the challenges facing the new electric power industry. The needed multidisciplinary expertise is not found at any one university. Information about our researchers can be found by clicking on [Researcher Profiles and Interests](#). Contact information for our university researchers can be found by clicking on [Members](#) and browsing to the University Members list.

### ***Collaborating Universities and Site Directors***

<b>Arizona State</b> (Jerry Heydt)	<b>Berkeley</b> (Shmuel Oren)	<b>Carnegie Mellon</b> (Marija Ilic)
<b>Colorado School of Mines</b> (P.K. Sen)	<b>Cornell</b> (Tim Mount)	<b>Georgia Tech</b> (A.P. Sakis Meliopoulos)
<b>Howard University</b> (James Momoh)	<b>Illinois</b> (Peter Sauer)	<b>Iowa State</b> (Jim McCalley)
<b>Texas A&amp;M</b> (Mladen Kezunovic)	<b>Washington State</b> (Anjan Bose)	<b>Wisconsin</b> (Christopher DeMarco)
	<b>Wichita State University</b> (Ward Jewell)	

## **Facilitator**

The PSERC Facilitator is Frank Wayno, Cornell University. Prof. Wayno assists the Director by facilitating communication among industry members and PSERC researchers.

## **Adjunct Research Professors**

Adjunct Research Professors are researchers with unique professional skills at a non-PSERC university who are working in collaboration to advance the mission of PSERC. PSERC's Adjunct Research Professors are (1) Ali Abur, Chair, Department of Electrical Engineering, Northeastern University; (2) Judith Cardell, Department of Computer Science, Smith College, and (3) Ross Baldick, Dept. of Electrical and Computer Engineering, University of Texas at Austin.

## ***Industrial Membership***

As a National Science Foundation Industry/University Cooperative Research Center, PSERC partners with industry to identify research needs and directions arising from the restructuring electric power industry, and to collaborate in implementing research projects. Through PSERC, industrial members can contribute to advancing the knowledge needed to address the challenges facing the industry and to educating the students that will become the next generation of industry professionals.

PSERC membership is open to companies, government agencies, associations and other organizations with interests in the electric power industry. Current membership comes from multiple industry sectors as well as from governmental organizations.

### ***Industrial Members***

<b>ABB</b>	<b>American Electric Power</b>
<b>American Transmission Company</b>	<b>AREVA T&amp;D</b>
<b>Arizona Public Service</b>	<b>Bonneville Power Administration</b>
<b>British Columbia Transmission Co.</b>	<b>California ISO</b>
<b>CenterPoint Energy</b>	<b>Duke Energy</b>
<b>Entergy</b>	<b>EPRI</b>
<b>Exelon</b>	<b>FirstEnergy</b>
<b>GE Energy</b>	<b>Institut de recherche d'Hydro-Québec (IREQ)</b>
<b>ISO New England</b>	<b>ITC Holdings</b>
<b>MidAmerican Energy</b>	<b>Midwest Independent Transmission System Operator (MISO)</b>
<b>National Grid USA</b>	<b>National Rural Electric Coop. Assn.</b>
<b>New York ISO</b>	<b>New York Power Authority</b>
<b>Pacific Gas and Electric</b>	<b>PJM Interconnection</b>
<b>PowerWorld Corp.</b>	<b>Salt River Project</b>
<b>Siemens</b>	<b>Southern California Edison</b>
<b>Southern Company</b>	<b>Tennessee Valley Authority</b>
<b>Tri-State Generation and Transmission</b>	<b>U.S. Department of Energy</b>
<b>Western Area Power Administration</b>	

PSERC provides its industrial members:

- Results of innovative research and early access to the research publications
- Opportunities for collaboration with leading researchers in power engineering and markets
- Means for sustaining high quality power engineering programs

- Communications with students about job opportunities
- Business opportunities for commercialization of intellectual property
- Education and professional development opportunities such as through workshops, short courses and on-line seminars

### **Industrial Advisory Board**

An Industrial Advisory Board provides the critical linkage between the industrial members and PSERC. The Board:

- Works with the universities to identify research and education needs
- Prioritizes projects and recommends project funding levels
- Reviews research results
- Addresses policy matters brought to it by the Director and Executive Committee of PSERC

The current officers of the Board are Jay Giri, Chair (AREVA T&D) and Floyd Galvan, Vice-Chair (Entergy).

The Industry Advisory Board meets twice annually. At the meetings, industrial members meet researchers and students from the member universities, hear progress reports on research projects, engage in current issue discussions with researchers and other industrial members, and advance their professional development through tutorials.

Contact information for our industrial members can be found by clicking on [Members](#) and browsing to the Industrial Members list.

## ***Contact Information***

<p>Vijay Vittal Director and Professor Dep. of Electrical Engineering Arizona State University Phone: 480-965-1879 Fax: 480-965-0745 e-mail: vijay.vittal@asu.edu</p>	<p>Dennis Ray, Ph.D. Executive Director University of Wisconsin-Madison Phone: 608-265-3808 Fax: 608-262-5559 e-mail: djray@wisc.edu</p>
<p>Anjan Bose Site Director Dean, College of Engineering &amp; Architecture Washington State University Phone: 509-335-5593 Fax: 509-335-9608 e-mail: bose@wsu.edu</p>	<p>Chris DeMarco Site Director, Professor Electrical and Computer Engineering University of Wisconsin-Madison Phone: 608-262-5564 Fax: 608-262-1267 e-mail: demarco@engr.wisc.edu</p>
<p>Gerald T. Heydt Site Director and Professor Dep. of Electrical Engineering Arizona State University Phone: 480-965-8307 Fax: 480-965-0745 email: heydt@asu.edu</p>	<p>Marija Ilic Site Director and Professor Electrical and Computer Engineering Carnegie-Mellon University Phone: 412-268-9520 Fax: 412-268-5229 e-mail: milic@andrew.cmu.edu</p>
<p>Ward Jewell Site Director and Professor, Electrical Engineering Wichita State University Phone: 316-978-6340 Fax: 316-978-5408 e-mail: ward.jewell@wichita.edu</p>	<p>Mladen Kezunovic Site Director and Professor Electrical Engineering Texas A&amp;M University Phone: 979-845-7509 Fax: 979-845-9887 e-mail: kezunov@ee.tamu.edu</p>
<p>Jim McCalley Site Director and Professor, Electrical &amp; Computer Engineering Iowa State University Phone: 515-294-4844 Fax: 515-294-5263 e-mail: jdm@iastate.edu.</p>	<p>A. P. Sakis Meliopoulos Site Director and Professor Electrical &amp; Computer Engineering Georgia Institute of Technology Phone: 404-894-2926 Fax: 404-894-4641 e-mail: sakis.meliopoulos@ece.gatech.edu</p>
<p>James Momoh Site Director and Professor (on leave to NSF) Electrical Engineering Howard University Phone: (202) 806-5350 Fax: 202-806-6588 e-mail: jm@scs.howard.edu</p>	<p>Shmuel S. Oren Site Director, Professor Industrial Engineering &amp; Operations Research University of California-Berkeley Phone: 510-642-7643 Fax: 510-642-1403 e-mail: oren@ieor.berkeley.edu</p>
<p>Peter W. Sauer Site Director and Professor (Interim Director) Electrical &amp; Computer Engineering University of Illinois at Urbana-Champaign Phone: 217-333-0394 Fax: 217-333-1162 e-mail: sauer@ece.uiuc.edu</p>	<p>P.K Sen Site Director and Professor Colorado School of Mines Phone: 303-384-2020 Fax: 303-273-3602 e-mail: psen@mines.edu</p>
<p>Timothy Mount Site Director and Professor Applied Economics and Management Cornell University Phone: 607-255-44512 Fax: 607-255-9984 e-mail: tdm2@cornell.edu</p>	<p>Frank Wayno PSERC Evaluator/Facilitator and Professor Cornell University School of Industrial &amp; Labor Relations Phone: 607-255-8009 Fax: 607-255-0574 e-mail: ffw2@cornell.edu</p>

**[Back to Table of Contents](#)**

## **Reports**

(click on the folder title above to view the current list of documents in this web site folder)

### **Reports available for viewing by PSERC members only**

08-26

[Decision Tree Based Online Voltage Security Assessment Using PMU Measurements](#)  
Vijay Vittal

08-25

[Integration of Substation IED Information into EMS Functionality](#)  
Mladen Kezunovic

08-24

[Tools for Assessment of Bidding into Electricity Auctions](#)  
Steve Puller

08-20

[Preventing Voltage Collapse with Protection Systems that Incorporate Optimal Reactive Power Control](#)  
Venkataramana Ajjarapu

08-18

[Detection, Prevention and Mitigation of Cascading Events](#)  
Mani Venkatasubramanian

08-17

[Agent Modeling for Integrated Power Systems](#)  
Chen-Ching Liu

06-44

[The Texas Energy-Only Resource Adequacy Mechanism](#)  
Shmuel Oren

06-10

[Executive Forum on Solutions to Transmission Investment](#)  
PSERC Executive Forum, April 21, 2006, in Chicago, IL

### **Publicly Available Reports**

#### [2008 Reports](#)

08-17

[Agent Modeling for Integrated Power Systems](#)  
Chen-Ching Liu

08-16

[Evaluation of Alternative Market Structure and Compensation Schemes for Incenting Transmission Reliability and Adequacy Related Investments](#)

Shijie Deng

08-15

[Massively Deployed Sensors](#)

Jerry Heydt

08-14

[Reliability, Electric Power, and Public vs. Private Goods: A New Look at the Role of Markets](#)

William Schulze

08-12

[Effective Power System Control Center Visualization](#)

Tom Overbye

08-07

[Optimized Fault Location](#)

Mladen Kezunovic

08-06

[Optimal Allocation of Static and Dynamic VAR Resources](#)

Sakis Meliopoulos

08-05

[Transient Testing of Protective Relays: Study of Benefits and Methodology](#)

Mladen Kezunovic, Sakis Meliopoulos, Ward Jewell

08-04

[Risk of Cascading Outages](#)

Ian Dobson and Jim McCalley

08-03

[Digital Protection System Using Optical Instrument Transformers and Digital Relays](#)

Interconnected by an IEC 61850-9-2 Digital Process Bus

Mladen Kezunovic, George Karady, Levi Portillo, Zarko Djekic, Sadik Kucaksar, Yan Ma

08-02

[Satellite Imagery for the Identification of Interference with Overhead Power Lines](#)

George Karady, Gerald Heydt, Matthias Moeller, Yoshihiro Kobayashi

08-01

[A Tool for On-line Stability Determination and Control for Coordinated Operations between Regional Entities Using PMUs](#)

Vijay Vittal, Gerald Heydt, A.P. Sakis Meliopoulos

## 2007 Reports

07-38

**Automated Circuit Breaker Monitoring**  
Mladen Kezunovic, Project Leader

07-31

**Reliability Based Vegetation Management Through Intelligent System Monitoring**  
B. Don Russell, Project Leader

07-17

**Uncertain Power Flows and Transmission Planning**  
Gerry Heydt and Peter Sauer

07-16

**The Electric Power Industry and Climate Change: Power Systems Research Possibilities**  
Tom Overbye, Project Leader

07-08

**Condition Indicator Analysis for the Enhancement of Power System State Estimators**  
Mark Rice

07-02

**Modeling Market Signals for Transmission Adequacy Issues: Valuation of Transmission Facilities and Load Participation Contracts in Restructured Electric Power Systems**  
Shijie Deng

07-01

**Reliability Assessment Incorporating Operational Considerations and Economic Aspects for Large Interconnected Grids**  
George Gross

## 2006 Reports

06-45

**Enhanced State Estimators**  
Ali Abur

06-42

**Prediction of Flashover Voltage of Insulators Using Low Voltage Surface Resistance Measurement**  
Ravi S. Gorur

06-40

**A Novel Approach for Prioritizing Maintenance of Underground Cables**  
Ravi S. Gorur

06-26

Risk-Based Resource Allocation for Distribution System Maintenance

Ward Jewell

06-23

Performance Assessment of Advanced Digital Measurement and Protection Systems: Part I

George Karady

06-22

Performance Assessment of Advanced Digital Measurement and Protection Systems: Part II

Mladen Kezunovic

06-21

Consequences of Fault Currents Contributed by Distributed Generation

Natthaphob Nimpitiwan

06-04

Automated Integration of Condition Monitoring with an Optimized Maintenance Scheduler for Circuit Breakers and Power Transformers

Jim McCalley, project leader

06-03

Control and Design of Microgrid Components

Robert H. Lasseter, Project Leader

06-02

Security Enhancement through Direct Non-Disruptive Load Control: Part II

Vijay Vittal

06-01

Security Enhancement through Direct Non-Disruptive Load Control: Part I

Ian Hiskens, Project Leader

## 2005 Reports

05-65

Visualization of Power Systems and Components

Thomas J. Overbye, Project Leader

05-64

New System Control Methodologies: Adapting AGC and Other Generator Controls to the Restructured Environment

Christopher L. DeMarco, Project Leader

05-63

Effects of Voltage Sags on Loads in a Distribution System

George Karady, Project Leader

05-62

**New Implications of Power System Fault Current Limits**

G.T. Heydt, Project Leader

05-61

**Detection, Prevention and Mitigation of Cascading Events:Part III**

Vijay Vittal and Xiaoming Wang

05-60

**Detection, Prevention and Mitigation of Cascading Events: Part II**

Vaithianathan “Mani” Venkatasubramanian and Jaime Quintero

05-59

**Detection, Prevention and Mitigation of Cascading Events: Part I**

Mladen Kezunovic, Hongbiao Song and Nan Zhang

05-58

**Optimal Placement of Phasor Measurement Units for State Estimation**

Ali Abur, project leader

05-57

**Enhanced Reliability of Power System Operation Using Advanced Algorithms and IEDS (Part II): Detecting Circuit Breaker Status Errors in Substations**

Ali Abur

05-56

**Enhanced Reliability of Power System Operation Using Advanced Algorithms and IEDs: Part I**

Mladen Kezunovic, project leader

05-55

**Market Redesign: Incorporating the Lessons Learned for Enhancing Market Design**

Shmuel Oren, Project Leader

05-37

**Software Agents for Market Design and Analysis**

Sarosh Talukdar, Project Leader

05-36

**Estimation of Synchronous Generator Parameters from On-line Measurements**

Gerald T. Heydt, Project Leader

05-14

**Distribution System Electromagnetic Modeling and Design for Enhanced Power Quality**

Sakis Meliopoulos, Project Leader

05-13

**Comprehensive Power System Reliability Assessment**

Sakis Meliopoulos, Project Leader

05-04

[\*\*On-Line Transient Stability Assessment Scoping Study\*\*](#)

Vijay Vittal

05-02

[\*\*Phasor Measurement Unit Data in Power System State Estimation\*\*](#)

Mark Rice and Gerald T. Heydt

## 2004 Reports

04-35

[\*\*The Evaluation of Stochastic Available Transfer Capability for Transmission Expansion\*\*](#)

Gerald T. Heydt and Jonathan W. Stahlhut

04-34

[\*\*Consequences of Fault Currents Contributed by Distributed Generation\*\*](#)

N. Nimpitiwan and G.T. Heydt

04-33

[\*\*Structuring Electricity Markets for Demand Responsiveness: Experiments on Efficiency and Operational Consequences\*\*](#)

Richard E. Schuler

04-32

[\*\*Evaluation of Critical Components of Nonceramic Insulators \(NCI\) In-Service: Role of Defective Interfaces\*\*](#)

Ravi Gorur (Project Leader)

04-27

[\*\*Optical Sensor for Transformer Monitoring\*\*](#)

Rahmat Shoureshi (Project Leader)

04-26

[\*\*Intelligent Transformer Monitoring System Utilizing Neuro-Fuzzy Technique Approach\*\*](#)

Rahmat Shoureshi (Project Leader)

04-25

[\*\*Evaluation of Distributed Electric Energy Storage and Generation\*\*](#)

Ward Jewell (Project Leader)

## 2003 Reports

03-33

**Interval Analysis for Unknown Dependencies and Genetic Algorithm Emulation of Markets**  
Gerald B. Sheblé (Project Leader)

03-26

**Risk-Based Maintenance Allocation and Scheduling for Bulk Transmission System Equipment**  
Jim McCalley (Project Leader)

03-06

**Integrated Security Analysis**  
Kevin Tomsovic (Project Leader)

03-05

**Optimal Bidding Strategy in Electricity Markets Under Uncertain Energy and Reserve Prices**  
Rajesh Rajaraman and Fernando Alvarado

## 2002 Reports

02-49

**Voltage Security Margin Assessment**  
Garng M. Huang and Ali Abur

02-48

**Enhanced State Estimation by Advanced Substation Monitoring**  
Ali Abur (Project Leader)

02-47

**Mobile Agent Applications for Power Apparatus Monitoring and Maintenance**  
Mladen Kezunovic (Project Leader)

02-46

**Wireless Communications in Substations**  
Mladen Kezunovic (Project Leader)

02-45

**Power System State Estimation and Optimal Measurement Placement for Distributed Multi-Utility Operation**  
Ali Abur and Garng Huang

02-44

**Accurate Fault Location in Transmission Networks Using Modeling, Simulation and Limited Field Recorded Data**  
Mladen Kezunovic (Project Leader)

02-43

**Robust Control of Large Scale Power Systems**

Vijay Vittal (Project Leader)

02-42

**Market Mechanisms for Competitive Electricity**

Shmuel Oren (Project Leader)

02-36

**Visualization of Power Systems**

Thomas J. Overbye, Douglas A. Wiegmann and Robert J. Thomas

02-35

**Personnel Grounding and Safety Issues/Solutions Related to Servicing Optical Fiber Telecommunication Circuits in Optical Ground Wire (OPGW)**

Richard G. Olsen, Sakis Meliopoulos and George Karady

02-31

**Differential GPS Measurement of Overhead Conductor Sag: Software Implementation**

G. T. Heydt and Robert Olsen

02-28

**Coordination of Transmission Line Transfer Capabilities**

Mani V. Venkatasubramanian

02-26

**Investigation of Fuel Cell System Performance and Operation: A Fuel Cell as a Practical Distributed Generator**

George Karady, Priyantha Sirisooriya and Richard G. Farmer

02-25

**Condition Monitoring and Maintenance Strategies for In-Service Nonceramic Insulators (NCI), Underground Cables and Transformers**

Ravi Gorur

02-24

**Development of a Graphic User Interface for an Overhead Conductor Sag Instrument**

Gerald T. Heydt

02-23

**Congestion Management in Restructured Power Systems Using an Optimal Power Flow Framework**

A.S. Nayak and M.A. Pai

02-18

**Identification and Tracking of Parameters for a Large Synchronous Generator**

G. T. Heydt and Elias Kyriakides

02-17

[Assessing Deterioration of ADSS Fiber Optic Cables Due to Corona Discharge](#)

George G. Karady and Johnny Madrid

[2001 Reports](#)

01-34

[Electric Power Transfer Capability: Concepts, Applications, Sensitivity, Uncertainty](#)

Ian Dobson, Scott Greene, Rajesh Rajaraman, Chris DeMarco, Fernando Alvarado, Mevludin Glavic, Jianfeng Zhang, Ray Zimmerman

01-28

[Analysis and Design of Power Acceptability Curves for Industrial Loads](#)

John Kyei

01-21

[Simulation of Top-Oil Temperature for Transformers](#)

Yong Liang

01-16

[Electric Transmission Line Flashover Prediction System](#)

Felix Amarh

01-05

[Automated Operating Procedures for Transfer Limits](#)

Liqiang Chen, Kevin Tomsovic and Anjan Bose

01-02

[CPFLOW for Power Tracer and Voltage Monitoring](#)

Hsiao-Dong Chiang and Dr. Hua Li

01-01

[Computer Simulation of Cascading Disturbances in Electric Power Systems](#)

Hongye Wang and James S. Thorp

[2000 Reports](#)

00-08

[Reactive Power Support Services in Electricity Markets](#)

Sauer, Overbye, Gross, Alvarado, Oren and Momoh

00-01

[Avoiding and Suppressing Oscillations](#)

Dobson, Alvarado, DeMarco, Sauer, Zhang, Greene and Engdahl

[Back to Table of Contents](#)

## **2008 Publications**

(click on the folder title above to view the current list of documents in this web site folder)

08-23

[Long-Term Effect of the n-1 Criterion on Cascading Line Outages in an Evolving Power Transmission Grid](#)

Hui Ren, Ian Dobson, Benjamin A. Carreras

08-22

[Using Transmission Line Outage Data to Estimate Cascading Failure Propagation in an Electric Power System](#)

Hui Ren and Ian Dobson

08-21

[The Economic Value of Improving the Reliability of Supply on a Bulk Power Transmission Network](#)

Tim Mount, Alberto Lamadrid, Surin Maneevitjit, Bob Thomas, Ray Zimmerman

08-19

[The Economic Implications of Adding Wind Capacity to a Bulk Power Transmission Network](#)

Tim Mount, Lindsay Anderson, Judy Cardell, Alberto Lamadrid, Surin Maneevitjit, Bob Thomas, Ray Zimmerman

08-13

[Estimating Wind Turbine Parameters and Quantifying Their Effects on Dynamic Behavior \(S-34\)](#)

Ian Hiskens, Jonathon Rose

08-11

[VaR Constrained Hedging of Fixed Price Load-Following Obligations in Competitive Electricity Markets](#)

Yumi Oum, Shmuel Oren

08-10

[Optimal Transmission Switching - Sensitivity Analysis and Extensions](#)

Shmuel Oren, Kory Hedman, Richard O'Neill, Bartholomew Fisher

08-09

[Optimal Transmission Switching with Contingency Analysis](#)

Shmuel Oren, Kory Hedman, Richard O'Neill, Bartholomew Fisher

08-08

[Control of Inverter-Connected Sources in Autonomous Microgrids](#)

Ian A. Hiskens, Eric M. Fleming

08-04

Initial Review of Methods for Cascading Failure Analysis in Electric Power Transmission Systems

IEEE PES CAMS Task Force on Cascading Failures

[\*\*Back to Table of Contents\*\*](#)

## **2007 Publications**

(click on the folder title above to view the current list of documents in this web site folder)

07-37

[Line Outage Detection Using Phasor Angle Measurements](#)

Zeb Tate, Tom Overbye

07-36

[Interactive Lessons for Pre-University Power Education](#)

Zeb Tate, Tom Overbye, Jana Sebestik, George Reese

07-35

[Acceptability of Four Transformer Top-Oil Thermal Models: Pt. 2\\_Comparing Metrics](#)

Lida Jauregui Rivera, Daniel J. Tylavsky

07-34

[Acceptability of Four Transformer Top-Oil Thermal Models: Pt. 1\\_Defining Metrics](#)

Lida Jauregui Rivera, Daniel J. Tylavsky

07-33

[Assessing the Reliability of Linear Dynamic Transformer Thermal Modeling](#)

Xiaolin Mao, Daniel J. Tylavsky, Gary A. McCulla

07-32

[Transformer Thermal Modeling Improving Reliability Using Data Quality Control](#)

Daniel J. Tylavsky, Xiaolin Mao, Gary A. McCulla

07-30

[Economic Consequences of Alternative Solution Methods for Centralized Unit Commitment in Day-Ahead Electricity Markets](#)

Ramteen Sioshansi, Richard O'Neill, Shmuel S. Oren

07-29

[An Equilibrium Pricing Model for Weather Derivatives in a Multi-commodity Setting](#)

Yongheon Lee, Shmuel S. Oren

07-28

[Optimal Static Hedging of Volumetric Risk in a Competitive Wholesale Electricity Market](#)

Yumi Oum, Shmuel Oren

07-27

[Do Generation Firms in Restructured Electricity Markets Have Incentives to Support Social-Welfare-Improving Transmission Investments?](#)

Enzo E. Sauma, Shmuel S. Oren

07-26

[Transmission Unit Commitment for Optimal Dispatch-Sensitivity Analysis and Extensions](#)

Kory W. Hedman, Richard P. O'Neill, Emily Bartholomew Fisher, Shmuel S. Oren

07-25

[Complex Systems Analysis of Series of Blackouts: Cascading Failure, Critical Points, and Self-organization](#)

Ian Dobson, Ben Carreras, Vickie Lynch, David Newman

07-24

[Towards Quantifying Cascading Blackout Risk](#)

Ian Dobson, Kevin Wierzbicki, Janghoon Kim, Hui Ren

07-23

[Extended Microgrid Using \(DER\) Distributed Energy Resources](#)

Robert H. Lasseter and Paolo Piagi

07-22

[CERTS Microgrid](#)

Robert H. Lasseter

07-21

[Microgrid Protection](#)

H. Nikkhajoei and Robert H. Lasseter

07-20

[Microgrids and Distributed Generation](#)

Robert H. Lasseter

07-19

[Towards More Flexible and Robust Data Delivery for Monitoring and Control of the Electric Power Grid](#)

David E. Bakken, Carl H. Hauser, Harald Gjermundrød, and Anjan Bose

07-18

[Challenges of Integrating Large Amounts of Wind Power](#)

Jonathan Rose and Ian Hiskens

07-15

[Border Flow Rights and Contracts for Differences of Differences: Models for Electric Transmission Property Rights](#)

Ross Baldick

07-14

[Visualization and Characterization of Stability Swings via GPS-Synchronized Data](#)

George J. Cokkinides, A. P. Sakis Meliopoulos, George Stefopoulos, Ramiz Alaileh and Apurva Mohan

07-13

**A Next Generation Alarm Processing Algorithm Incorporating Recommendations and Decisions on Wide Area Control**

Elias Kyriakides, Jonathan W. Stahlhut, and Gerald T. Heydt

07-12

**A Probabilistic Graphical Approach to Computing Electricity Price Duration Curves under Price and Quantity Competition**

Pascal Michaillat and Shmuel Oren

07-11

**Modeling of Suppliers' Learning Behaviors in a Market Environment**

Nanpeng Yu, Chen-Ching and LiuLeigh Tesfatsion

07-10

**A Comparison of Local vs. Sensory, Input-Driven, Wide Area Reactive Power Control**

Jonathan W. Stahlhut, Gerald. T. Heydt, and Elias Kyriakides

07-09

**The Assessment of the Measurement of the Poynting Vector for Power System Instrumentation**

Jonathan W. Stahlhut, Timothy J. Browne, and Gerald T. Heydt

07-08

**Condition Indicator Analysis for the Enhancement of Power System State Estimators**

Mark Rice

07-07

**Do Generation Firms in Restructured Electricity Markets Have Incentives to Support Socially-Efficient Transmission Investments?**

Enzo E. Sauma and Shmuel S. Oren

07-06

**Electricity Price Curve Modeling by Manifold Learning**

Jie Chen, Shi-Jie Deng, and Xiaoming Huo

07-05

**Stochastic Co-optimization for Hydro-Electric Power Generation**

Shi-Jie Deng, Youxun Shen, and Haibin Sun

07-04

**Where is the Edge for Cascading Failure?: Challenges and Opportunities for Quantifying Blackout Risk**

Ian Dobson

07-03

**Microgrid Fault Protection Based on Symmetrical and Differential Current Components**

Hassan Nikkhajoei and Robert H. Lasseter

**Back to Table of Contents**

## **2006 Publications**

(click on the folder title above to view the current list of documents in this web site folder)

06-57

[Proactive Transmission Investment in Competitive Power Systems](#)

Enzo E. Sauma and Shmuel S. Oren

06-56

[Continuation-Based Quasi-Steady-State Analysis](#)

Qin Wang, Hwachang Song, and Venkataramana Ajjarapu

06-55

[A Decoupled Time-Domain Simulation Method via Invariant Subspace Partition for Power System Analysis](#)

Dan Yang and Venkataramana Ajjarapu

06-54

[Identification of Market Power in Large-Scale Electric Energy Markets](#)

Bernard C. Lesieutre, HyungSeon Oh, Robert J. Thomas and Vaibhav Donde

06-53

[Transmission System Expansion Plans in View Point of Deterministic, Probabilistic and Security Reliability Criteria](#)

Jaeseok Choi, Timothy Mount and Robert Thomas

06-52

[Multi-Area System Security: The Economic Impacts of Security Criterion Selection](#)

T. Guler, G. Gross, E. Litvinov, and R. Coutu

06-50

[Effects of Protection System Hidden Failures on Bulk Power System Reliability](#)

A.P. Sakis Meliopoulos, Fang Yang, George J. Cokkinides, and Q. Binh Dam

06-50

[Contingency Simulation Using Single Phase Quadratized Power Flow](#)

F. Yang, A.P. Sakis Meliopoulos, G.J. Cokkinides, and G.K. Stefopoulos

06-49

[Security-Constrained Adequacy Evaluation of Bulk Power System Reliability](#)

Fang Yang, A.P. Sakis Meliopoulos, George J. Cokkinides, and George K. Stefopoulos

06-48

[Markets for Reactive Power and Reliability: A White Paper](#)

Robert J. Thomas, Timothy Mount, Richard Schuler, William Schulze, Ray Zimmerman, Dan Shawhan and David Toomey

06-47

**Advanced Fault Diagnosis Techniques and Their Role in Preventing Cascading Blackouts**  
Nan Zhang

06-46

**Transmission Line Boundary Protection Using Wavelet Transform and Neural Network**  
Nan Zhang and Mladen Kezunovic

06-43

**New Wide-Area Algorithms for Detecting Angle Instability Using Synchrophasors**  
Dongchen Hu and Vaithianathan “Mani” Venkatasubramanian

06-41

**Value-Added Simulation of Hybrid Systems**  
Ian A. Hiskens

06-39

**Generalized Line Outage Distribution Factors**  
Teoman Guler, George Gross and Minghai Liu

06-38

**Detection of Island Formation and Identification of Causal Factors under Multiple Line Outages**  
Teoman Guler and George Gross

06-37

**A Proposed Design for a Short-Term Resource Adequacy Program**  
George Gross and Pablo A. Ruiz

06-36

**Economic Criteria for Planning Transmission Investment in Restructured Electricity Markets**  
Enzo E. Sauma and Shmuel S. Oren

06-35

**Multi-Area Generation Adequacy Planning Using Stochastic Programming**  
Chanan Singh and Panida Jirutitijaroen

06-34

**A Hybrid Method for Multi-Area Generation Expansion using Tabu- search and Dynamic Programming**  
Chanan Singh and Panida Jirutitijaroen

06-33

**A Global Decomposition Algorithm for Reliability Constrained Generation Planning and Placement**  
Chanan Singh and Panida Jirutitijaroen

06-32

**Reliability and Cost trade-off in Multi-Area Power System Generation Expansion Using Dynamic Programming and Global Decomposition**

Chanan Singh and Panida Jirutitijaroen

06-31

**Switching-Induced Stable Limit Cycles**

Ian A. Hiskens and Patel Bhageerath Reddy

06-30

**Distributed Output Feedback MPC for Power System Control**

Ian A. Hiskens, Aswin N. Venkat, James B. Rawlings, and Stephen J. Wright

06-29

**Distributed MPC Strategies for Automatic Generation Control**

Ian A. Hiskens, Aswin N. Venkat, James B. Rawlings, and Stephen J. Wright

06-28

**Cournot Equilibrium in Two-settlement Electricity Markets: Formulation and Computation**

Jian Yao

06-27

**Sensitivity, Approximation and Uncertainty in Power System Dynamic Simulation**

Ian A. Hiskens and Jassim Alseddiqi

06-25

**Complete Fault Analysis for Long Transmission Line Using Sychronized Sampling**

Nan Zhang, Mladen Kezunovic

06-24

**Non-Collocated Voltage and Current Measurements Used to Obtain Power**

Brian C. Mann and Jerry Heydt

06-20

**Accuracy Improvement Strategies for Problematic Power System Measurements and their Effect on State Estimation**

Brian C. Mann and Jerry Heydt

06-19

**Modeling and Computing Two-settlement Oligopolistic Equilibrium in a Congested Electricity Network**

Jian Yao, Ilan Adler, and Shmuel S. Oren

06-18

**Statistical Estimation of Cascading Blackout Size and Propagation with Branching Processes**

Kevin Wierzbicki

06-17

**An Approach to Statistical Estimation of Cascading Failure Propagation in Blackouts**

Kevin Wierzbicki and Ian Dobson

06-16

**Human Factors Aspects of Three-Dimensional Visualization of Power System Information**

Douglas A. Wiegmann, Thomas J. Overbye, Stephan M. Hoppe, Gavin R. Essenberg and Yan Sun

06-15

**Compatibility and Interoperability Evaluation for All-digital Protection System through Automatic Application Test**

Peichao Zhang, Levi Portillo and Mladen Kezunovic

06-14

**Prediction of Flashover Voltage of Non-ceramic Insulators Under Contaminated Conditions**

S. Venkataraman and R. S. Gorur

06-13

**How Good are Supply Function Equilibrium Models: An Empirical Analysis of the ERCOT Balancing Market**

Ramteen Sioshansi and Shmuel S. Oren

06-12

**Identification of Network Parameter Errors**

Jun Zhu and Ali Abur

06-11

**Transient Based Relay Testing: A New Scope and Methodology**

Nan Zhang, Hongbiao Song, and Mladen Kezunovic

06-09

**An Analytical Framework for Short-Term Resource Adequacy in Competitive Electricity Markets**

Pablo A. Ruiz and George Gross

06-08

**Autonomous Control of Microgrids**

Paolo Piagi and Robert H. Lasseter

06-07

**Significance of Load Modelling in Power System Dynamics**

I.A. Hiskens

06-06

**Load as a Controllable Resource for Dynamic Security Enhancement**

I.A. Hiskens

06-05

An Energy Reference Bus Independent LMP Decomposition Algorithm

Xu Cheng and Tom Overbye

[Back to Table of Contents](#)

## **2005 Publications**

(click on the folder title above to view the current list of documents in this web site folder)

05-75

[Induction Motor Load Dynamics: Impact on Voltage Recovery Phenomena](#)

George K. Stelopoulos and A. P. Meliopoulos

05-74

[Testing the Effect of Inter-Regional Transfers of Real Energy on the Performance of Electricity Markets](#)

T.D. Mount and R.J. Thomas

05-73

[Proactive Planning and Valuation of Transmission Investments in Restructured Electricity Markets](#)

Enzo E. Sauma and Shmuel S. Oren

05-72

[Reliability, Electric Power, and Public vs. Private Goods: A New Look at the Role of Markets](#)

David Toomey, William Schulze, Richard Schuler, Robert Thomas, and James Thorp

05-71

[A Method for Classifying Offer Strategies Observed in an Electricity Market](#)

HyungSeon Oh, Robert J. Thomas, Bernard C. Lesieutre, Timohthy D. Mount

05-70

[Non-Collocated Power Measurements in a Power System State Estimator](#)

B. Mann, G. Heydt and G. Strickler

05-69

[Automated Monitoring Functions for Improved Power System Operation and Control](#)

Mladen Kezunovic and G. Latisko

05-68

[Conflicting Investment Incentives in Electricity Transmission](#)

Enzo Sauma and Shmuel S. Oren

05-67

[Volumetric Hedging in Electricity Procurement](#)

Yumi Oum, Shmuel Oren and Shijie Deng

05-66

[Optimal Market Grain Over Space and Time](#)

Nodir Adilov and Richard E. Schuler

05-62

**Preventing Future Blackouts by Means of Enhanced Electric Power Systems Control: From Complexity to Order**

Marija Ilíc, Eric Allen, Jeffrey J. Chapman, Charles A. King, Jeffrey H. Lang, and Eugene Litvinov

05-54

**Electricity Markets: How Many, Where and When?**

Nodir Adilov and Richard E. Schuler

05-53

**Managing Relationships Between Electric Power Industry Restructuring and Grid Reliability**

Robert J. Thomas

05-52

**Strategies to Address the Problem of Exiting Expertise in the Electric Power Industry**

Dennis Ray and Bill Snyder

05-51

**Monitoring of Power System Topology in Real-Time**

Mladen Kezunovic

05-50

**Two-Sided Electricity Markets: Self-Healing Systems**

Richard E. Schuler

05-49

**Condition Data Aggregation with Application to Failure Rate Calculation of Power Transformers**

Jyotishman Pathak, Yong Jiang, Vasant Honavar, and James McCalley

05-48

**Issues Associated with the Development of a Wide-Area Analysis and Visualization Environment**

John P. Stovall, Brendan J. Kirby, Thomas J. Overbye, James S. Thorp, and Arun G. Phadke

05-47

**An Estimator of Propagation of Cascading Failure**

Ian Dobson, Kevin Wierzbicki, Ben Carreras, Vickie Lynch, David Newman

05-46

**Interface between Engineering and Market Operations in Restructured Electricity Systems**

Hung-po Chao, Shmuel Oren, Alex Papalexopoulos, Dejan Sobajic, and Robert Wilson

05-45

**Observed Hybrid Oscillations in an Electrical Distribution System**

Vaibhav Donde and Ian A. Hiskens

05-44

**Non-Uniqueness in Reverse Time of Hybrid System Trajectories**

Ian A. Hiskens

05-43

**Dynamic Performance Assessment: Grazing and Related Phenomena**

Vaibhav Donde and Ian Hiskens

05-42

**Power System Modeling for Inverse Problems**

Ian A. Hiskens

05-41

**Limit-Induced Stable Limit Cycles in Power Systems**

P.B. Reddy and I.A. Hiskens

05-40

**Convexity of the Set of Feasible Injections and Revenue Adequacy in FTR Markets**

Bernard C. Lesieurte and Ian A. Hiskens

05-39

**Shooting Methods for Locating Grazing Phenomena in Hybrid Systems**

Vaibhav Donde and Ian A. Hiskens

05-38

**Differences in Capacity Requirements, Line Flows and System Operability under Alternative Deregulated Market Structures: Simulations Derived from Experimental Trials**

Nodir Adilov, Thomas Light, Richard Schuler, William Schulze, David Toomey and Ray Zimmerman

05-35

**Fault Current Issues for Market Driven Power Systems with Distributed Generation**

Natthaphob Nimpitiwan and Gerald T. Heydt

05-34

**Fault Current Calculation by The Least Squares Method**

Natthaphob Nimpitiwan and Gerald T. Heydt

05-33

**Criticality in a Cascading Failure Blackout Model**

Dusko Nedic, Ian Dobson, Daniel Kirschen, Ben Carreras, and Vickie Lynch

05-32

**Implementing an Advanced Simulation Tool for Comprehensive Fault Analysis**

Nan Zhang and Mladen Kezunovic

05-31

**A Novel Digital Relay Model Based on SIMULINK and Its Validation Based on Expert System**  
Xu Luo and Mladen Kezunovic

05-30

**Static Security Analysis based on Vulnerability Index (VI) and Network Contribution Factor (NCF) Method**  
Hongbiao Song and Mladen Kezunovic

05-29

**Interactive Protection System Simulation Using ATP MODELS and C++**  
Xu Luo and Mladen Kezunovic

05-28

**Fault Analysis Based on Integration of Digital Relay and DFR Data**  
Xu Luo and Mladen Kezunovic

05-27

**Automated Analysis of Protective Relay Data**  
Mladen Kezunovic, Xu Luo

05-26

**Automated Analysis of Digital Relay Data Based on Expert System**  
Xu Luo and Mladen Kezunovic

05-25

**Requirements Specification for and Evaluation of an Automated Substation Monitoring System**  
Mladen Kezunovic and G. Latisko

05-24

**Quantification of Corona Discharges on Nonceramic Insulators**  
B. Pinnangudi, R. S. Gorur, and A. J. Kroese

05-23

**Predicting Contamination Flashover of Insulators: Successes and Shortcomings of Tests and Simulations**  
Ravi S. Gorur and S. Venkataraman

05-22

**Insulators for Cold Urban Areas: The Problem of Road Salt**  
Ravi Gorur and Sreeram Venkataraman

05-21

**Automatic Simulation Of IED Measurements For Substation Data Integration Studies**  
Yang Wu and Mladen Kezunovic

05-20

[Optimal Placement and Utilization of Phasor Measurements for State Estimation](#)

Xu Bei, Yeo Jun Yoon and Ali Abur

05-19

[Model Reduction in Power Systems Using Krylov Subspace Methods](#)

Dimitrios Chaniotis and M. A. Pai

05-18

[Improving Real-time Fault Analysis and Validating Relay Operations to Prevent or Mitigate Cascading Blackouts](#)

Nan Zhang, Mladen Kezunovic

05-17

[Static Analysis of Vulnerability and Security Margin of the Power System](#)

Hongbiao Song and Mladen Kezunovic

05-16

[Coordinating Fuzzy ART Neural Networks to Improve Transmission Line Fault Detection and Classification](#)

Nan Zhang and Mladen Kezunovic

05-15

[A Study of Synchronized Sampling Based Fault Location Algorithm Performance under Power Swing and Out-of-step Conditions](#)

Nan Zhang and Mladen Kezunovic

05-12

[CERTS Proves that Two Grids are Better than One](#)

David Engle

05-11

[Hedging Quantity Risks with Standard Power Options in a Competitive Wholesale Electricity Market](#)

Yumi Oum and Shmuel Oren

05-10

[Pricing and Hedging Electricity Supply Contracts: a Case with Tolling Agreements](#)

Shi-Jie Deng and Zhendong Xia

05-09

[The Inherent Inefficiency of Simultaneously Feasible Financial Transmission Rights Auctions](#)

Shi-Jie Deng, Shmuel Oren, and Sakis Meliopoulos

05-08

[Electricity Derivatives and Risk Management](#)

Shi-Jie Deng and Shmuel Oren

05-07

[\*\*The Impact of Various Upgrade Strategies on the Long-Term Dynamics and Robustness of the Transmission Grid\*\*](#)

David Newman, Ben Carreras, Vickie Lynch, and Ian Dobson

05-06

[\*\*A Criticality Approach to Monitoring Cascading Failure Risk and Failure Propagation in Transmission Systems\*\*](#)

Ian Dobson, Ben Carreras, and David Newman

05-05

[\*\*Cournot Equilibria in Two-Settlement Electricity Markets with System Contingencies\*\*](#)

Jian Yao, Shmuel S. Oren, and Ilan Adler

05-04

[\*\*On-Line Transient Stability Assessment Scoping Study\*\*](#)

Vijay Vittal, Project Leader

05-03

[\*\*Technical Considerations for Broadband Powerline \(BPL\) Communication\*\*](#)

Robert G. Olsen

05-02

[\*\*Phasor Measurement Unit Data in Power System State Estimation\*\*](#)

Mark Rice and Gerald T. Heydt

05-01

[\*\*Reducing the Risk of Major Blackouts Through Improved Power System Visualization\*\*](#)

Thomas J. Overbye, Douglas A. Wiegmann

[\*\*Back to Table of Contents\*\*](#)

## **2004 Publications**

(click on the folder title above to view the current list of documents in this web site folder)

04-55

[\*\*Role of Distribution Factors in Congestion Revenue Rights\*\*](#)

Minghai Liu and George Gross

04-54

[\*\*Evolving Nature of Electricity Market Design in the U.S.\*\*](#)

George Gross

04-53

[\*\*Float Together/ Sink Together? \(The Effect of Connectivity on Power Systems\)\*\*](#)

Richard E. Schuler

04-52

[\*\*Protecting the Market from “Hockey Stick” Pricing: How the Public Utility Commission of Texas is Dealing with Potential Price Gouging\*\*](#)

David Hurlbut, Keith Rogas and Shmuel Oren

04-51

[\*\*Dynamic Embedded Optimization and Shooting Methods for Power System Performance Assessment\*\*](#)

I.A. Hiskens, J-W. Park and V. Donde

04-50

[\*\*Verifying the Protection System Operation Using an Advanced Fault Analysis Tool Combined with the Event Tree Analysis\*\*](#)

Nan Zhang and Mladen Kezunovic

04-49

[\*\*Stability Control using PEBS method and Analytical Sensitivity of the Transient Energy Margin\*\*](#)

Hongbiao Song, Mladen Kezunovic

04-48

[\*\*Relieving Overload and Improving Voltage by the Network Contribution Factor \(NCF\) Method\*\*](#)

Hongbiao Song, Mladen Kezunovic

04-47

[\*\*A Comprehensive Contribution Factor Method for Congestion Management\*\*](#)

Hongbiao Song, Mladen Kezunovic

04-46

[\*\*Observability Analysis and Measurement Placement for Systems with PMUs\*\*](#)

Bei Xu and Ali Abur

04-45

**Testing the Effects of Holding Forward Contracts On the Behavior of Suppliers in an Electricity Auction**

Hyungna Oh and Tim Mount

04-44

**Visualization and Animation of State Estimation Performance**

A. P. Sakis Meliopoulos, George J. Cokkinides, Mike Ingram, Sandra Bell, and Sherica Mathews

04-43

**Automated Monitoring and Control Using New Data Integration Paradigm**

Mladen Kezunovic, Tanja Djokic, and Tatjana Kostic

04-42

**Market Structure and the Predictability of Electricity System Line Flows: An Experimental Analysis**

Nodir Adilov, Thomas Light, Richard Schuler, William Schulze, David Toomey, and Ray Zimmerman

04-41

**Static Collapse and Topological Cuts**

Santiago Grijalva and Peter W. Sauer

04-40

**Cournot Equilibrium in Price-capped Two-Settlement Electricity Markets**

Jian Yao, Bert Willems, Shmuel S. Oren, and Ilan Adler

04-39

**Joint Energy and Reserves Auction with Opportunity Cost Payment for Reserves**

Shmuel Oren and Ramteen Sioshansi

04-38

**On the Efficiency of the New York Independent System Operator Market for Transmission Congestion Contracts**

Afzal S. Siddiqui, Emily S. Bartholomew, Chris Marnay, and Shmuel S. Oren

04-37

**The Probability, Identification, and Prevention of Rare Events in Power Systems**

Qiming Chen

04-36

**Self-Regulating Markets for Electricity: Letting Customers into the Game**

Richard E. Schuler

04-32

**Complex Systems Analysis of Series of Blackouts: Cascading Failure, Criticality, and Self-organization**

Ian Dobson, Ben Carreras, Vickie Lynch, David Newman

04-31

[Branching Process Models for the Exponentially Increasing Portions of Cascading Failure Blackouts](#)

Ian Dobson, Ben Carreras, David Newman

04-30

[Planning of Reconfigurable Power Systems](#)

J. McCalley, R. Kumar, N. Elia, V. Ajjarapu, V. Vittal, H. Liu, L. Jin, O. Volij, W. Shang

04-29

[Electrical Blackouts: A Systemic Problem](#)

Jay Apt, Lester B. Lave, Sarosh Talukdar, M. Granger Morgan, and Marija Ilic

04-28

[Analysis of Angle Stability Problems: A Transmission Protection Systems Perspective](#)

S. A. Soman, T. B. Nguyen, M. A. Pai, and R. Vaidyanathan

04-24

[Self-Regulating Electricity Markets?](#)

Nodir Adilov, Thomas Light, Richard Schuler, William Schulze, David Toomey and Ray Zimmerman

04-23

[Human Factors Aspects of Power System Flow Animation](#)

Doug Wiegmann, Gavin Essenberg, Tom Overbye, and Yan Sun

04-22

[Estimating Failure Propagation in Models of Cascading Blackouts](#)

Ian Dobson, Ben Carreras, Vickie Lynch, Bertrand Nkei, David Newman

04-21

[Metrics for Application of Revenue Sensitivity Analysis to Predict Market Power Coalitions in Electricity Markets](#)

Mary Cain and Fernando Alvarado

04-20

[The Inherent Inefficiency of Simultaneously Feasible Financial Transmission Rights Auctions](#)

Shijie Deng, Shmuel Oren and Sakis Meliopoulos

04-19

[Computing Cournot Equilibria in Two Settlement Electricity Markets with Transmission Constraints](#)

Jian Yao, Shmuel S. Oren, Ilan Adler

04-18

[Framework for the Design and Analysis of Congestion Revenue Rights](#)

Minghai Liu and George Gross

04-17

**Competitive Acquisition of Prioritizable Capacity-Based Ancillary Services**  
Gianfranco Chicco and George Gross

04-16

**Comparative Analysis of Congestion Management Schemes under a Unified Framework**  
Ettore Bompadr, Pedro Correia, George Gross, and Mikael Amelin

04-15

**An Efficient Procedure For The Rational Buyer Approach For The Acquisition Of Capacity-Based Ancillary Services**

Gianfranco Chicco and George Gross

04-14

**The Impact of Uncertainty on Incentives to Collude in Electricity Markets**

Mary B. Cain and Fernando L. Alvarado

04-13

**Three-Dimensional Displays as an Effective Visualization Technique for Power Systems Monitoring and Control**

Stephan Hoppe, Gavin Essenberg, Doug Wiegmann, and Tom Overbye

04-12

**Voltage Stability Enhancement via Model Predictive Control of Load**

Ian Hiskens and Bo Gong

04-11

**Combined State Estimation and Measurement Calibration**

Shan Zhong and Ali Abur

04-10

**Innovative concepts for on-line synchronous generator parameter estimation**

Elias Kyriakides

04-09

**Auto Tuning of Measurement Weights in WLS State Estimation**

S. Zhong and Ali Abur

04-08

**Fault Current Issues for Market Driven Power Systems with Distributed Generation**

N. Nimpitiwan, G. Heydt

04-07

**Estimation of Synchronous Generator Parameters Using an Observer for Damper Currents and a Graphical User Interface**

Elias Kyriakides and G.T. Heydt

04-06

[\*\*Implications of Cost and Bid Format on Electricity Market Studies: Linear Versus Quadratic Costs\*\*](#)

Mary Cain and Fernando Alvarado

04-05

[\*\*Microgrid: A Conceptual Solution\*\*](#)

R. H. Lasseter and Paolo Piagi

04-04

[\*\*Visualizations for Power System Contingency Analysis Data\*\*](#)

Yan Sun and Tom Overbye

04-03

[\*\*Probabilistic load-dependent cascading failure with limited component interactions\*\*](#)

Ian Dobson, Ben Carreras, David Newman

04-02

[\*\*Modifying Eigenvalue Interactions Near Weak Resonance\*\*](#)

Vincent Auvray, Ian Dobson, Louis Wehenkel

04-01

[\*\*A Loading-Dependent Model of Probabilistic Cascading Failure\*\*](#)

Ian Dobson, Ben Carreras, David Newman

[\*\*Back to Table of Contents\*\*](#)

## **2003 Publications**

(click on the folder title above to view the current list of documents in this web site folder)

03-37

[Transmission Congestion-Management Schemes: A Comparative Analysis Under a Unified Framework](#)

E. Bompard, P. Correia, G. Gross and M. Amelin

03-36

[Converting System Limits to Market Signals](#)

Fernando Alvarado

03-35

[The 2003 Blackout: Did the System Operator have Enough Power?](#)

F. L. Alvarado and R. Rajaraman

03-34

[The New York Transmission Congestion Contract Market: Is It Truly Working Efficiently?](#)

Emily S. Bartholomew, Afzal S. Siddiqui, Chris Marnay, and Shmuel S. Oren

03-33

[The Inherent Inefficiency of the Point-to-Point Congestion Revenue Right Auction](#)

Shi-Jie Deng, Shmuel Oren, and Sakis Meliopoulos

03-32

[Trajectory Sensitivity Theory in Non Linear Dynamical Systems: Some Power System Applications](#)

M. A. Pai and T. B. Nguyen

03-31

[Dynamic Security-Constrained Rescheduling of Power Systems Using Trajectory Sensitivities](#)

Tony B. Nguyen and M. A. Pai

03-30

[Scaling of normal form analysis coefficients under coordinate change](#)

Ian Dobson, Emilio Barocio

03-29

[Perturbations of Weakly Resonant Power System Electromechanical Modes](#)

Ian Dobson, Emilio Barocio

03-28

[Collaboration to Facilitate Research and Education in a Transitioning Electric Power Industry](#)

Dennis Ray and Frank Wayno

03-27

[An Essential Industry at the Crossroads: Deregulation, Restructuring, and a New Model for the United States' Bulk Power System](#)

Jeffrey Hein

03-26

[Risk-Based Maintenance Allocation and Scheduling for Bulk Transmission System Equipment](#)

Jim McCalley, Tim Van Voorhis, A.P. Meliopoulos and Yong Jiang

03-25

[The Effect of Customer Participation in Electricity Markets: An Experimental Analysis of Alternative Market Structures](#)

Richard E. Schuler, William D. Schulze, Nodir Adilov and David Toomey

03-24

[Dynamical and Probabilistic Approaches to the Study Of Blackout Vulnerability of the Power Transmission Grid](#)

Ben Carreras, Vicki Lynch, Ian Dobson, David Newman

03-23

[New Solutions for Substation Sensing, Signal Processing and Decision Making](#)

Mladen Kezunovic and Henry Taylor

03-22

[Coordinated Interchange Scheduling and Opportunity Cost Payment: A Market Proposal to Seams Issues](#)

Jie Chen, James S. Thorp and Timothy D. Mount

03-21

[The Influence of Futures Markets on Real Time Price Stabilization in Electricity Markets](#)

David Watts and Fernando L. Alvarado

03-20

[A Branching Process Approximation to Cascading Load-Dependent System Failure](#)

Ian Dobson, Ben Carreras, David Newman

03-19

[Cascading Failures: Survival vs. Prevention](#)

Sarosh N. Talukdar, Jay Apt, Marija Ilic, Lester B. Lave, and M. Granger Morgan

03-18

[A Comparison of the AC and DC Power Flow Models for LMP Calculations](#)

Thomas J. Overbye, Xu Cheng and Yan Sun

03-17

[Complex Dynamics of Blackouts in Power Transmission Systems](#)

Ben Carreras, Vicki Lynch, Ian Dobson, David Newman

03-16

An Interactive - Dynamic Mechanism Conceptualizing the Cost and Benefit of Electric Power Quality

Geun-Joon Lee and Gerry T. Heydt

03-15

Embedding Remote Experimentation In Power Engineering Educ

Mihaela M. Albu, Keith E. Holbert, Gerald T. Heydt, Sorin Dan Grigorescu and Vasile Trucă

03-14

Design Of Delayed-Input Wide Area Power System Stabilizer Using Gain Scheduling Method

Hongxia Wu and Gerry T. Heydt

03-13

The Propagation of Disturbances in Power Distribution Systems

N. Nimpitiwan, et al

03-12

Quantum Computing in Power System Simulation

Daniel J. Tylavsky and Gerry T. Heydt

03-11

The Reliability Analysis of High Power Switches Composed of Series and Parallel Branches

G.T. Heydt, et al

03-10

Critical points and transitions in an electric power transmission model for cascading failure blackouts

Ben Carreras, Vicki Lynch, Ian Dobson, David Newman

03-09

Cascading dynamics and mitigation assessment in power system disturbances via a hidden failure model

Jie Chen, James Thorp, Ian Dobson

03-08

Three Dimensional Visualization for Power System Contingency Analysis Voltage Data

Yan Sun and Thomas J. Overbye

03-07

Motion as an Effective Flow Visualization Technique for Power Systems Monitoring and Control

G.R. Essenber, D.A. Wiegmann, T.J. Overbye and Y. Sun

03-04

National Energy Supergrid Workshop Report

Tom Overbye, Chauncey Starr, Paul Grant and Tom Schneider

03-03

[Fuel Parameter and Quality Constraints for Microturbine Distributed Generators](#)  
Phanikrishna Gomatom and Ward Jewell

03-02

[Fuel Parameter and Quality Constraints for Fuel Cell Distributed Generators](#)  
Phanikrishna Gomatom and Ward Jewell

03-01

[Feeding our Profession](#)  
Gerald T. Heydt and Vijay Vittal

[Back to Table of Contents](#)

## **2002 Publications**

(click on the folder title above to view the current list of documents in this web site folder)

02-67

[California Electricity Market Crisis: Causes, Remedies, and Prevention](#)

C. Mensah-Bonsu, and S. Oren

02-66

[Effectiveness of the Distribution Factor Approximations Used in Congestion Modeling](#)

Minghai Liu and George Gross

02-65

[Comments on the FERC SMD NOPR](#)

Shmuel Oren

02-64

[Economic Congestion Relief Across Multiple Regions Requires Tradable Physical Flow-Gate Rights](#)

Shmuel S. Oren and Andrew M. Ross

02-63

[L<sub>p</sub> State Estimators for Power Systems](#)

N. Logic, E. Kyriakides and G. T. Heydt

02-62

[Consequence and Impact of Electric Utility Industry Restructuring on Transient Stability and Small Signal Stability Analysis](#)

Vijay Vittal

02-61

[Risk-based Maintenance Allocation and Scheduling for Bulk Electric Power Transmission System Equipment](#)

Yong Jiang, Ming Ni, James D. McCalley and Tim Van Voorhis

02-60

[Harmonic Limits for Single-Phase Equipment](#)

Ward Jewell and Dan Ward

02-59

[Single Phase Harmonic Limits](#)

Ward Jewell and Daniel J. Ward

02-58

[Feasibility Evaluation of Distributed Energy Generation and Storage for Cost and Reliability Using the ‘Worth-Factor’ Criterion](#)

Phanikrishna Gomatom and Ward Jewell

02-57

[Is System Control Entirely by Price Feasible?](#)

Fernando L. Alvarado

02-56

[A MultiPhase Power Flow Model for  \$\mu\$ Grid Analysis](#)

A. P. Sakis Meliopoulos, George J. Cokkinides, and Robert Lasseter

02-55

[Locational Pricing and Scheduling for an Integrated Energy-Reserve Market](#)

Jie Chen, James S. Thorp, Robert J. Thomas, and Timothy D. Mount

02-54

[Identifying Transformer Incipient Events for Maintaining Distribution System Reliability](#)

Karen L. Butler-Purry, and Mustafa Bagriyanik

02-53

[Bluenet II - A Detailed Realization of the Algorithm and Performance Analysis](#)

Zhifang Wang, Zygmunt J. Haas, and Robert J. Thomas

02-52

[Data Integration and Information Exchange for Enhanced Control and Protection of Power Systems](#)

Mladen Kezunovic

02-51

[Animation and Visualization of Spot Prices via Quadratized Power Flow Analysis](#)

A. P. Sakis Meliopoulos, Sun Wook Kang, G. J. Cokkinides, and Roger Dougal

02-50

[Visualization for Shipboard Power Systems](#)

Karen L. Butler-Purry and N.D.R. Sarma

02-40

[Estimating the Actual Cost of Transmission System Congestion](#)

Thomas J. Overbye

02-39

[Displaying Aggregate Data, Interrelated Quantities, and Data Trends in Electric Power Systems](#)

Ray Klump, Warren Wu, and Greg Dooley

02-38

[Two-Settlement Systems for Electricity Markets](#)

Rajnish Kamat and Shmuel S. Oren

02-37

[Designs for Ramp-Constrained Day-Ahead Auctions](#)

Shmuel S. Oren and Andrew A. Ross

02-36

**Visualization of Power Systems**

Thomas J. Overbye, Douglas A. Wiegmann and Robert J. Thomas

02-35

**Personnel Grounding and Safety Issues/Solutions Related to Servicing Optical Fiber Telecommunication Circuits in Optical Ground Wire (OPGW)**

Richard G. Olsen, Sakis Meliopoulos and George Karady

02-34

**Markets for Reliability and Financial Options in Electricity: Theory to Support the Practice**

Tim Mount, William Schulze and Richard E. Schuler

02-33

**A probabilistic loading-dependent model of cascading failure and possible implications for blackouts**

Ian Dobson, Ben Carreras, David Newman

02-32

**Blackout Mitigation Assessment in Power Transmission Systems**

Ben Carreras, Vicki Lynch, David Newman, Ian Dobson

02-30

**Incorporating Operational Characteristics and Startup Costs in Option-Based Valuation of Power Generation Capacity**

Shi-Jie Deng and Shmuel Oren

02-29

**An Initial Complex Systems Analysis of the Risks of Blackouts in Power Transmission Systems**

Ian Dobson, David Newman, Ben Carreras and Vickie Lynch

02-28

**Coordination of Transmission Line Transfer Capabilities**

Mani V. Venkatasubramanian

02-27

**Equilibrium Analysis of Forward Markets for Electricity and Reserves**

Afzal Saeed Siddiqui

02-26

**Investigation of Fuel Cell System Performance and Operation: A Fuel Cell as a Practical Distributed Generator**

George Karady, Priyantha Sirisooriya and Richard G. Farmer

02-25

**Condition Monitoring of In-Service Nonceramic Insulators and Underground Cables**

R. S. Gorur

02-24

**Development of a Graphic User Interface for an Overhead Conductor Sag Instrument**  
G. T. Heydt

02-23

**Congestion Management in Restructured Power Systems Using an Optimal Power Flow Framework**  
A.S. Nayak and M.A. Pai

02-22

**A Novel Method for Transmission Network Fault Location Using Genetic Algorithms and Sparse Field Recordings**  
Mladen Kezunovic, Shanshan Luo and Donald R. Sevcik

02-21

**Advanced Substation Data Collecting and Processing for State Estimation Enhancement**  
X. Xu, M.Kezunovic and D. Wong

02-20

**Agent-Oriented Approach to Work Order Management for Circuit Breaker Maintenance**  
X. Xu, M.Kezunovic and D. Wong

02-19

**Computation Of Critical Values Of Parameters In Power Systems Using Trajectory Sensitivities**  
Tony B. Nguyen, M. A. Pai and I. A. Hiskens

02-18

**Identification and Tracking of Parameters for a Large Synchronous Generator**  
G. T. Heydt and Elias Kyriakides

02-17

**Assessing Deterioration of ADSS Fiber Optic Cables Due to Corona Discharge**  
George G. Karady and Johnny Madrid

02-16

**Supergames in Electricity Markets: Beyond the Nash Equilibrium Concept**  
Pedro Correia, Thomas J. Overbye and Ian Hiskens

02-15

**Incorporating TCSC into the Voltage Stability Constrained OPF Formulation**  
Garng M. Huang and Nirmal-Kumar C. Nair

02-14

**Voltage Stability Constrained Load Curtailment Procedure to Evaluate Power System Reliability Measures**  
Garng M. Huang and Nirmal-Kumar C. Nair

02-13

**Measurement Design of Data Exchange for Distributed Multi-Utility Operation**  
Garng M. Huang and Jiansheng Lei

02-12

**Detection of Dynamic Voltage Collapse**  
Garng M. Huang and Nirmal-Kumar C. Nair

02-11

**Contribution Allocation for Voltage Stability In Deregulated Power Systems**  
Garng M. Huang and Kun Men

02-10

**A New Bifurcation Analysis for Power System Dynamic Voltage Stability Studies**  
Garng M. Huang and Liang Zhao

02-09

**A Knowledge Based Data Exchange Design for Distributed Mega-RTO Operations**  
Garng M. Huang and Jiansheng Lei

02-08

**A Concurrent Non-Recursive Textured Algorithm for Distributed Multi-Utility State Estimation**  
Garng M. Huang and Jiansheng Lei

02-07

**An Individual Welfare Maximization Algorithm for Electricity Markets**  
James D. Weber and Thomas J. Overbye

02-06

**(Dis)Proving Market Power**  
Fernando Alvarado

02-05

**An Advanced Visualization Platform for Real-Time Power System Operations**  
Ray Klump, David Schooley and Thomas Overbye

02-04

**Symbolic Dynamic Models for Highly Varying Power System Loads**  
Diwakar Tewari

02-03

**Human Factors Aspects of Power System Voltage Contour Visualizations**  
Thomas J. Overbye, Douglas A. Wiegmann, Aaron M. Rich and Yan Sun

02-02

**Two-Settlement Systems for Electricity Markets: Zonal Aggregation under Network Uncertainty and Market Power**  
Rajnish Kamat and Shmuel S. Oren

02-01

[Quantifying Transmission Reliability Margin](#)

Jianfeng Zhang, Ian Dobsonr and Fernando Alvarado

[Back to Table of Contents](#)

## **2001 Publications**

(click on the folder title above to view the current list of documents in this web site folder)

01-49

[State Estimation for the Detection of Market Parameters](#)

Fernando Alvarado

01-48

[The FGR vs. FTR debate: Facts and Misconceptions](#)

Shmuel S. Oren

01-47

[A Phase-Transition Model for Cascading Network Failure](#)

Chris DeMarco

01-46

[Real Time Digital Processing of GPS Measurements for Transmission Engineering](#)

C. Mensah-Bonsu and G. T. Heydt

01-45

[Visualization and Animation of Inverter-Driven Induction Motor Operation](#)

A. P. Sakis Meliopoulos, W. Gao, and George J. Cokkinides

01-44

[Testing The Effects Of Price Responsive Demand On Uniform Price And Soft-Cap Electricity Auctions](#)

R. J. Thomas, T. D. Mount, R. Zimmerman, W. D. Schulze, R. E. Schuler, and L. D. Chapman

01-43

[Spectral Analysis of Energy-Constrained Reserves](#)

Fernando L. Alvarado

01-42

[Post-Contingency Equilibrium Analysis of Power Systems](#)

Peter W. Sauer

01-41

[Multi-settlement Systems for Electricity Markets: Zonal Aggregation under Network Uncertainty and Market Power](#)

Rajnish Kamat and Shmuel S. Oren

01-40

[Bluenet – a New Scatternet Formation Scheme](#)

Zhifang Wang, Robert J. Thomas, Zygmunt Haas

01-39

**Integrating Distributed Generation Technology into Demand Management Schemes**

M. Fahrioglu, T. Yong, R. Lasseter and F. Alvarado

01-38

**Improving Circuit Breaker Maintenance Management Tasks by Applying Mobile Agent Software Technology**

M. Kezunovic, X. Xu and D. Wong

01-37

**Mobile Agent Software Applied in Maintenance Scheduling**

X. Xu and M. Kezunovic

01-36

**Electricity Supply Organization: Which End Is Up?**

Richard E. Schuler

01-35

**Effects of Non-transposed Lines and Unbalanced Loads on State Estimation**

Shan Zhong, Ali Abur

01-34

**Electric Power Transfer Capability: Concepts, Applications, Sensitivity, Uncertainty**

Ian Dobson, Scott Greene, Rajesh Rajaraman, Chris DeMarco, Fernando Alvarado, Mevludin Glavic, Jianfeng Zhang, Ray Zimmerman

01-33

**On Completion Times of Networks of Concurrent and Sequential Tasks**

Daniel Berleant, Lizhi Xie, Jianzhone Zhang and Gerry Sheble

01-32

**Measurement Design and State Estimation for Distributed Multi-Utility Operation**

Garng M. Huang, Jiansheng Lei

01-31

**An OPF based Algorithm to Evaluate Load Curtailment Incorporating Voltage Stability Margin Criterion**

Garng M. Huang and Nirmal-Kumar C. Nair

01-30

**Mobile Agent Software Applied in Maintenance Scheduling**

M. Kezunovic, X. Xu

01-29

**A Spectral Bisection Partitioning Method for Electric Power Network Applications**

Supun Tiptipakorn

01-28

[Analysis and Design of Power Acceptability Curves for Industrial Loads](#)  
John Kyei

01-27

[Human Factors Aspects of Power System Voltage Visualizations](#)  
Doug Wiegmann, Aaron Rich, Tom Overbye, Yan Sun

01-26

[Using Weather Derivatives to Improve the Efficiency of Forward Markets for Electricity](#)  
Tim Mount

01-25

[Power Systems Engineering Research Center](#)  
Ward Jewell and Dennis Ray

01-24

[Dynamics, Criticality and Self-Organization in a Model for Blackouts in Power Transmission Systems](#)  
Ben Carreras, Vickie Lynch, Ian Dobson, David Newman

01-23

[Examining Criticality of Blackouts in Power System Models with Cascading Events](#)  
Ian Dobson, Jie Chen, Jim Thorp, Ben Carreras, David Newman

01-22

[Transfer Capability Calculator and Tutorial](#)  
Ian Dobson, Scott Greene, Rajesh Rajaraman, Fernando Alvarado, Chris Demarco, Ray Zimmerman, Mevludin Glavic, Antonio DeSouza, Bob Thomas et al.

01-21

[Simulation of Top-Oil Temperature for Transformers](#)  
Yong Liang

01-20

[Market Based Risk Mitigation](#)  
Shmuel Oren

01-19

[Strong Resonance Effects in Normal Form Analysis and Subsynchronous Resonance](#)  
Ian Dobson

01-18

[Testing the Performance of Uniform Price and Discriminative Auctions](#)  
T.D. Mount, W.D. Schultze, R.J. Thomas and R.D. Zimmerman

01-17

[An Engineering Approach to Monitoring Market Power in Restructured Markets for Electricity](#)  
C.E. Murillo-Sanchez, S.M. Ede, T.D. Mount, R.J. Thomas and R.D. Zimmerman

01-16

[Electric Transmission Line Flashover Prediction System](#)  
Felix Amarch

01-15

[Storing Arb: Methods for Storage Valuation](#)  
Hyungsok Ahn, Albina Danilova and Glen Swindle

01-14

[Prospects for Dynamic Transmission Circuit Ratings](#)  
K. E. Holbert and G. T. Heydt

01-13

[Exotic Options for Interruptible Electricity Supply Contracts](#)  
Rajnish Kamat and Shmuel S. Oren

01-12

[Rational Buyer Meets Rational Seller: Reserves Market Equilibria under Alternative Auction Designs](#)  
Rajnish Kamat and Shmuel S. Oren

01-11

[Transaction Based Power Flow Analysis For Transmission Utilization Allocation](#)  
Garng Huang and H. Zhang

01-10

[TCSC as a Transient Voltage Stabilizing Controller](#)  
Garng Huang and Tong Zhu

01-09

[Measurement Based Voltage Stability Monitoring of Power System](#)  
Garng Huang and Liang Zhao

01-08

[Dynamic Voltage Stability Reserve Studies For Deregulated Environment](#)  
Garng Huang and H. Zhang

01-07

[Communication Models for Third Party Load Frequency Control](#)  
Sudipto Bhowmik, Kevin Tomsovic and Anjan Bose

01-06

[Adaptive Power Flow Method for Distribution Systems with Dispersed Generation](#)  
Yaming Zhu and Kevin Tomsovic

01-05

[Automated Operating Procedures for Transfer Limits](#)

Liqiang Chen, Kevin Tomsovic and Anjan Bose

01-04

[Is Strong Modal Resonance a Precursor to Power System Oscillations?](#)

Dobson, J. Zhang, S. Greene, H. Engdahl and P.W. Sauer

01-02

[CPFLOW for Power Tracer and Voltage Monitoring](#)

Hsiao-Dong Chiang and Hua Li

01-01

[Computer Simulation of Cascading Disturbances in Electric Power Systems](#)

Hongye Wang and James S. Thorp

[Back to Table of Contents](#)

## **2000 Publications**

(click on the folder title above to view the current list of documents in this web site folder)

00-41

[\*\*Generation Supply Bidding in Perfectly Competitive Electricity Markets\*\*](#)

George Gross and David Finlay

00-40

[\*\*Increasing Student Interest and Comprehension in Power Engineering Education at the Graduate and Undergraduate Levels\*\*](#)

George Karady and Gerry Heydt

00-39

[\*\*Instrumentation and Measurement of Overhead Conductor Sag Using the Differential Global Positioning Satellite System\*\*](#)

Chris Mensah-Bonsu

00-38

[\*\*Neural Network Based Modeling of a Large Steam Turbine-Generator Rotor Body Parameters from On-Line Disturbance Data\*\*](#)

H. B. Karayaka, A. Keyhani, G. T. Heydt, B. Agrawal and D.Selin

00-37

[\*\*Application of the Global Positioning System to the Measurement of Overhead Power Transmission Conductor Sag\*\*](#)

C. Mensah-Bonsu, U. Fernández, G. T. Heydt, Y. Hoverson, J. Schilleci and B. Agrawal

00-36

[\*\*Development of Enhanced Electric Arc Furnace Models for Transient Analysis\*\*](#)

Gilsoo Jang, Weiguo Wang, G. T. Heydt, S. S. Venkata and Byongjun Lee

00-35

[\*\*Synchronous Machine Parameter Estimation Using Orthogonal Series Expansion\*\*](#)

J. Rico, G. T. Heydt, A. Keyhani, B. Agrawal and D. Selin

00-34

[\*\*Visualization of Oscillation Mode Shapes and Participation Factors\*\*](#)

Thomas J. Overbye and Craig M. Martini

00-33

[\*\*Capacity Payments and Supply Adequacy in Competitive Electricity Markets\*\*](#)

S.S. Oren

00-32

[\*\*Impact of Renewable Distributed Generation on Power Systems\*\*](#)

M. Begovi, A. Pregelj, A. Rohatgi and D. Novosel

- 00-31  
[Stability of Limit Cycles in Hybrid Systems](#)  
I.A. Hiskens
- 00-30  
[Extended Factors for Linear Contingency Analysis](#)  
P. Sauer, K.E. Reinhard and T.J. Overbye
- 00-29  
[Network Control as a Distributed, Dynamic Game](#)  
S. Talukdar and E. Camonogara
- 00-28  
[Min-max Transfer Capability: A New Concept](#)  
D. Gan, X. Luo, D.V. Bourcier and R.J. Thomas
- 00-27  
[Simulation Environment for Development and Testing of Plug Compatible Power System Applications](#)  
R. Podmore, M. Robinson and A. Bose
- 00-26  
[Experimental Tests Of Competitive Markets For Electric Power](#)  
S. Ede, T. Mount, W. Schulze, R. Thomas and R. Zimmerman
- 00-25  
[The Effect of Loading on Reactive Market Power](#)  
A.C. Zambroni de Souza, F. Alvarado and M. Glavic
- 00-24  
[Electricity and Ancillary Services Markets in New York State: Market Power in Theory and Practice](#)  
R.E. Schuler
- 00-23  
[Unbundled Reactive Support Service: Key Characteristics and Dominant Cost Component](#)  
George Gross, Shu Tao, Ettore Bompard and Gianfranco Chicco
- 00-22  
[Utility Application of Fiber Optic Cables](#)  
G. Karady
- 00-21  
[Instrumentation And Measurement Of Overhead Conductor Sag Using The Differential Global Positioning Satellite System](#)  
C. Mensah-Bonsu

00-20

**Power System State Estimation: Modeling Error Effects and Impact on System Operation**  
A.P. Sakis Meliopoulos, B. Fardanesh and S. Zelingher

00-19

**A Virtual Environment for Protective Relaying Evaluation and Testing**  
A.P. Sakis Meliopoulos and G.J. Cokkinides

00-18

**Human Factors Analysis of Power System Visualizations**  
T.J Overbye, D.A. Wiegmann, A.M. Rich and Y. Sun

00-17

**Efficient Available Transfer Capability Analysis Using Linear Methods**  
Jamie Weber

00-16

**Optimization and Visualization of the North American Eastern Interconnect Power Market**  
Doug Hale and Tom Overbye

00-15

**Analysis of Electric Power System Disturbance Data**  
Jie Chen, James S. Thorp and Manu Parashar

00-14

**Design of Ancillary Service Markets**  
Shmuel S. Oren

00-13

**Modeling Blackout Dynamics In Power Transmission Networks With Simple Structure**  
B.A. Carreras, V.E. Lynch, M.L. Sachtjen, I. Dobson and D.E. Newman

00-12

**An Initial Model For Complex Dynamics In Electric Power System Blackouts**  
I. Dobson, B.A. Carreras, V.E. Lynch and D.E. Newman

00-11

**Evidence For Self-Organized Criticality In Power System Blackouts**  
B.A. Carreras, D.E. Newman, I. Dobson and A.B. Poole

00-10

**Are Price Spikes Predictable, Reproducible and Avoidable?**  
Timothy Mount

00-09

**Security Assessment: Decision Support Tools for Power System Operators**  
James McCalley

00-08

[Costing and Pricing of Ancillary Services Final Report](#)

Sauer, Overbye, Gross, Alvarado, Oren and Momoh

00-07

[Simulation of Bilateral Contracts in an AGC System after Restructuring](#)

V. Donde, M.A. Pai and I.A. Hiskens

00-06

[Enhancing Reliability of Power Protection Systems Economically in the Post-Restructuring Era](#)

J.S. Thorp and H. Wang

00-05

[New Methods for the Visualization of Electric Power System Information](#)

Tom Overbye and Jamie Weber

00-04

[Report of the Department of Energy's Power Outage Study Team](#)

DOE, National Labs and PSERC

00-03

[Is Strong Modal Resonance A Precursor To Power System Oscillations?](#)

Ian Dobson, Jianfeng Zhang, Scott Greene, Henrik Engdahl and Peter Sauer

00-02

[Stability Analysis of Interconnected Power Systems Coupled with Market Dynamics](#)

F.L. Alvarado , J. Meng, C.L. DeMarco and W.S. Mota

00-01

[Oscillations Project Final Report](#)

Dobson, Alvarado, DeMarco, Sauer, Zhang, Greene, Engdahl

[Back to Table of Contents](#)

## **1999 Publications**

(click on the folder title above to view the current list of documents in this web site folder)

99-17

[Solving Power Flow Problems with a Matlab Implementation of the Power System Applications Data Dictionary](#)

Fernando L. Alvarado

99-16

[Reactive Power Market Power](#)

F. Alvarado, T. Overbye and P. Sauer

99-15

[Sensitivity Of Transfer Capability Margins With A Fast Formula](#)

Scott Greene, Ian Dobson and Fernando Alvarado

99-14

[Assessment of Transmission Constraint Costs: Northeast U.S. Case Study](#)

Tom Overbye, Doug Hale, Tom Leckey and Jamie Weber

99-13

[Initial Evidence For Self-Organized Criticality In Electric Power System Blackouts](#)

Ben Carreras, David Newman, Ian Dobson and Bruce Poole

99-12

[Visualization of Power System Data](#)

Thomas J. Overbye and Jamie D. Weber

99-11

[Application of Optimal Multiplier Method in Weighted Least-Squares State Estimation Part II: Simulation](#)

Jianping Meng and Christopher L. DeMarco

99-10

[Application of Optimal Multiplier Method In Weighted Least- Squares State Estimation Part I: Theory](#)

Jianping Meng and Christopher L. DeMarco

99-09

[Fast Determination of Simultaneous Available Transfer Capability \(ATC\)](#)

Ronghai Wang, Robert H. Lasseter, Jiangping Meng and Fernando L. Alvarado

99-08

[Suggested Analytic Approach to Transmission Reliability Margin; Draft Report June 1999](#)

Jianfeng Zhang, Ian Dobson and Fernando L. Alvarado

99-07

[Detecting and Improving the Vulnerable Links in the Power Network:Part I](#)

Koeunyi Bae and James Thorp

99-06

[Using Utility Information to Calibrate Customer Demand Management Behavior Models](#)

Murat Fahrioglu and Fernando L. Alvarado

99-05

[Designing Cost Effective Demand Management Contracts using Game Theory](#)

Murat Fahrioglu and Fernando L. Alvarado

99-04

[Coordination of Excitation and Governing Control Based on Fuzzy Logic](#)

Taiyou Yong, Robert H. Lasseter and Wenjin Cui

99-03

[Optimal Power Flow Formulation in Market of Retail Wheeling](#)

Taiyou Yong and Robert Lasseter

99-02

[The Impact of Generation Mix On Placement Of Static Var Compensators](#)

Robert H. Lasseter and Ronghai Wang

99-01

[A Virtual Environment for Interactive Visualization of Power System Economic and Security Information](#)

Thomas J Overbye, Raymond P. Klump and Jamie D. Weber

[Back to Table of Contents](#)

## **1998 Publications**

(click on the folder title above to view the current list of documents in this web site folder)

98-34

[\*\*The Stability of Power Market Systems\*\*](#)

Fernando Alvarado

98-33

[\*\*The Dynamics of Customers Switching Suppliers in Deregulated Power Markets\*\*](#)

Richard E. Schuler

98-31

[\*\*Estimating the Volatility of Spot Prices in Restructured Electricity Markets and the Implications for Option Values\*\*](#)

Robert Ethier and Timothy Mount

98-30

[\*\*Designing Cost Effective Demand Management Contracts using Game Theory\*\*](#)

Murat Fahrioglu and Fernando L. Alvarado

98-28

[\*\*Stochastic Models of Energy Commodity Prices and Their Applications: Mean-reversion with Jumps and Spikes\*\*](#)

Shijie Deng

98-27

[\*\*Managing Transmission Risk: The Theory of Spatial Hedging and Arbitrage\*\*](#)

Rajesh Rajaraman and Fernando L. Alvarado

98-26

[\*\*Visualization of Flows and Transfer Capability in Electric Networks\*\*](#)

Thomas J. Overbye, James D. Weber and Mark Laufenberg

98-25

[\*\*Analysis and Visualization of Market Power in Electric Power Systems\*\*](#)

Thomas Overbye, Jamie Weber and Kollin Patten

98-24

[\*\*Identifying Swing Mode Bifurcations & Associated Limits on Available Transfer Capability\*\*](#)

C.L. DeMarco

98-23

[\*\*Control of Distributed Resources\*\*](#)

Robert H. Lasseter

98-22

**Market Power and Price Volatility in Restructured Markets for Electricity**  
Tim Mount

98-21

**Analytic and Experimentally-Derived Estimates of Market Power in Deregulated Electricity Systems: Policy Implications for the Management and Institutional Evolution of the Industry**  
Richard E. Schuler

98-20

**Short-Term Generation Asset Valuation**

Chung Li Tseng and Graydon Bartz

98-19

**Energy Auctions and Market Power: An Experimental Examination**

Ray D. Zimmerman, John C. Bernard, Robert J. Thomas and William Schulze

98-18

**Price-Based Adaptive Spinning Reserve Requirements in Power System Scheduling**

Chung-Li Tseng; Shmuel S. Oren , Alva J. Svoboda; and Raymond B. Johnson

98-17

**Combining Financial Double Call Options with Real Options for Early Curtailment of Electricity Service**

Shmuel S. Oren

98-16

**Priority Network Access Pricing for Electric Power**

Shijie Deng and Shmuel Oren

98-15

**Capturing Non-Convexities in Multi-Unit Electricity Auctions**

Wedad J. Elmaghhraby

98-14

**Multi-unit Auctions With Complementarities: Issues of Efficiency in Electricity Auctions**

Wedad J. Elmaghhraby

98-13

**Exotic Electricity Options and the Valuation of Electricity Generation and Transmission Assets**

Shijie Deng, Blake Johnson and Aram Sogomonian

98-12

**The Efficiency of Multi-Unit Electricity Auctions**

Wedad J. Elmaghhrabi and Shmuel S. Oren

98-11

**Margin and Sensitivity Methods for Security Analysis of Electric Power Systems**  
Scott Green

98-10

**Is Modal Resonance A Precursor To Power Systems Oscillations?**

Ian Dobson, Jianfeng Zhang, Scott Greene, Henrik Engdahl and Peter Sauer

98-09

**A Transient Stability Constrained Optimal Power Flow**

Deqiang Gan, Robert J. Thomas and Ray D. Zimmerman

98-08

**Alternative Auction Institutions for Purchasing Electric Power: An Experimental Examination**

John Bernard, Ray Zimmerman, William Schulze, Robert Thomas, Timothy Mount and Richard Schuler

98-07

**Market Power: A Dynamic Definition**

Fernando L. Alvarado

98-06

**The Design of Optimal Demand Management Programs**

Murat Fahrioglu and Fernando L. Alvarado

98-05

**Alternatives for Calculating Transmission Reliability Margin (TRM) in Available Transfer Capability (ATC)**

Peter W. Sauer

98-04

**Voltage Collapse Margin Sensitivity Methods applied to the Power System of Southwest England**

Scott Greene and Ian Dobson

98-03

**Markets for Electric Power: Experimental Results for Alternative Auction Institutions**

John Bernard, Robert Ethier, Timothy Mount, William Schulze, Ray D. Zimmerman, Deqiang Gan, Carlos Murillo-Sanchez, Robert J. Thomas and Richard Schuler

98-02

**Real Time Control of Oscillations of Electric Power Systems**

P. Sauer, M. Pai, S. Fernandes, I. Dobson, F. Alvarado, S. Greene, R. Thomas and H-D. Chiang

98-01

[MATPOWER: Users's Manual \(Version 2.0\)](#)

Ray Zimmerman and Deqiang Gan

[Back to Table of Contents](#)

## **1997 Publications**

(click on the folder title above to view the current list of documents in this web site folder)

97-22

[Re-Dispatching Generation to Increase Power System Security Margin and Support Low Voltage Bus](#)

Ronghai Wang and Robert H. Lasseter

97-21

[StatCom Controls for Operation with Unbalanced Voltages](#)

Clark Hochgraf and Robert Lasseter

97-20

[The Impact of Generation Mix on Placement of Static Var Compensators](#)

Robert H. Lasseter and Ronghai Wang

97-19

[Solving Unit Commitment by a Unit Decommitment Method](#)

Chung-Li Tseng, Chao-an Li and Shmuel Oren

97-18

[Underlying Technical Issues in Electricity Deregulation](#)

Robert J. Thomas and Thomas R. Schneider

97-17

[Inclusion of Price Dependent Load Models in the Optimal Power Flow](#)

J.D. Weber, T.J. Overbye and C.L. DeMarco

97-16

[A Simulation Based Approach to Pricing Reactive Power](#)

J.D. Weber, T.J. Overbye, P.W. Sauer and C.L. DeMarco

97-15

[The Efficiency of Multi-Unit Electricity Auctions](#)

Wedad Elmaghhraby and Shmuel Oren

97-14

[A Transmission-Constrained Unit Commitment Method](#)

Chung-Li Tseng, Shmuel S. Oren, Carol S. Cheng, Chao-an Li, Alva J. Svoboda and Raymond B. Johnson

97-13

[An Importance Sampling Application: 179 Bus WSCC System under Voltage Based Hidden Failures and Relay Misoperations](#)

Koeunyi Bae and James S. Thorp

97-12

[Thermal Unit Commitment Including Optimal AC Power Flow Constraints](#)

Carlos Murillo-Sanchez and Robert J. Thomas

97-11

[An Internet-Based Platform for Testing Generation Scheduling Auctions](#)

Ray Zimmerman, Robert Thomas, Deqiang Gan and Carlos Murillo-Sanchez

97-10

[PowerWeb User's Manual](#)

Robert J. Thomas, Ray D. Zimmerman and Robert Ethier

97-09

[Initial Concepts for Applying Sensitivity to Transfer Capability](#)

Scott Greene, Ian Dobson, Fernando L. Alvarado and Peter W. Sauer

97-08

[Contingency Ranking for Voltage Collapse via Sensitivities from a Single Nose Curve](#)

Scott Greene, Ian Dobson and Fernando L. Alvarado

97-07

[Sensitivity Of The Loading Margin To Voltage Collapse With Respect To Arbitrary Parameters](#)

Scott Greene, Ian Dobson and Fernando L. Alvarado

97-06

[MinISO: A Minimal Independent System Operator](#)

Pravin Varaiya and Felix Wu

97-05

[Unbundling Power Quality Services: Technical Issues](#)

Robert Lasseter and Clark Hochgraf

97-04

[Technical Challenges of Computing Available Transfer Capability \(ATC\) in Electric Power Systems](#)

Peter W. Sauer

97-03

[A Simulation Tool for Analysis of Alternative Paradigms for the New Electricity Business](#)

Thomas J. Overbye, Peter W. Sauer, George Gross, Mark J. Laufenberg and Jamie D. Weber

97-02

[Simulation of the Multi-Node Open Access Same-Time Information System](#)

Yong Tian and George Gross

97-01

The Dynamics of Power System Markets

Fernando L. Alvarado

[Back to Table of Contents](#)

## **Resources for Understanding Power Systems and Blackouts**

The following background papers, written by PSERC researchers, provide insights into power systems operations and technologies along with current issues affecting the economical and reliable delivery of power. They serve as a tutorial for individuals seeking a better understanding of how an interconnected power system works. They are not intended for power system experts.

[Monitoring and Control of Power Grids: Looking Beyond Reliability Standards](#). Anjan Bose. Washington State University.

[Modeling Post-Disturbance Consequences: Uncertainty in Power System Dynamic Simulation](#). Ian A. Hiskens, University of Wisconsin-Madison, and Bernie C. Lesieutre, Lawrence Berkeley National Laboratory.

[Automated Monitoring and Analysis](#). Mladen Kezunovic. Texas A&M University.

[Distributed Generation](#). Robert H. Lasseter. University of Wisconsin-Madison.

[Power System Operation and Visualization](#). Thomas J. Overbye. University of Illinois at Urbana-Champaign.

[What is Reactive Power?](#) Peter W. Sauer. University of Illinois at Urbana-Champaign. Revised, Sep. 16.

- [Simulation of a DC Voltage Collapse](#)
- [Simulation of an AC Voltage Collapse](#)
- [Simulation of a Voltage Collapse of the Eastern Interconnection Using a 1998 Power System Model](#) (Note: A PDF version can be downloaded.)

[The New Electric Power Business: An Information-Based Revolution](#). Robert J. Thomas. Cornell University.

[The Protection System in Bulk Power Networks](#). James S. Thorp. Cornell University.

[Transient Stability and Control of Large Scale Power Systems](#). Vijay Vittal. Iowa State University.

[Analyzing Blackout Events: Experience from the Major Western Blackouts in 1996](#). Mani V. Venkatasubramanian. Washington State University.

[Blackouts: How often do we want them?](#) Anjan Bose. August 26, 2003.

## **Presentations by PSERC Researchers**

(click on the folder title above to view the current list of documents in this web site folder)

Presentations listed alphabetically by the author's last name.

[\*\*Creating Incentives for New Technologies in the Transmission System of the Future\*\*](#)  
Fernando L. Alvarado

[\*\*Electric Service Reliability\*\*](#)  
Fernando Alvarado

[\*\*Interdependencies In Networks\*\*](#)  
Fernando L. Alvarado

[\*\*Locational Aspects of Distributed Generation\*\*](#)  
Fernando L. Alvarado

[\*\*On the Inherent Inefficiencies of TLR for Trading Electricity\*\*](#)  
Fernando L. Alvarado

[\*\*Reliability Concepts and Market Power\*\*](#)  
Fernando Alvarado

[\*\*A Tutorial on the Flowgates versus Nodal Pricing Debate\*\*](#)  
Fernando L. Alvarado and Shmuel S. Oren

[\*\*Real Time Control of Power Grids\*\*](#)  
Anjan Bose, Kevin Tomsovic and Mani Venkatasubramanian

[\*\*Overall blackout risk and cascading failure\*\*](#)  
Ian Dobson, Ben Carreras, and David Newman

[\*\*Assessment of Transmission Congestion Impacts on Electricity Markets\*\*](#)  
George Gross

[\*\*Challenges and Opportunities in the New Transmission Business, Part 1\*\*](#)  
George Gross

[\*\*Challenges and Opportunities in the New Transmission Business, Part 2\*\*](#)  
George Gross

[\*\*Some Reflections On The Status And Trends In Power Engineering Education\*\*](#)  
George Gross

[\*\*The FERC Standard Market Design Proposal\*\*](#)  
George Gross

[Contemporary Topics in Electric Power Quality](#)  
G. T. Heydt

[A Short Course on Synchronous Machines and Synchronous Condensers](#)  
G. Heydt, S. Kalsi and E. Kyriakides

[Power Factor and Reactive Power](#)  
Ward Jewell

[Practical Electric Power Quality Tutorial](#)  
Ward Jewell

[MicroGrid Operation and Control](#)  
Robert H. Lasseter, A. P. Sakis Meliopoulos and Giri Venkataramanan

[Microgrids and the Macrogrid](#)  
Robert H. Lasseter and others. Presentation to the California Public Utilities Commission

[Comprehensive Reliability Assessment](#)  
Sakis Meliopoulos

[Testing Market Structures Before Problems Occur](#)  
Tim Mount

[Capacity Payments and Supply Adequacy in Competitive Electricity Markets](#)  
Shmuel S. Oren

[Data Visualization for Effective Grid Monitoring & Control in a Complex Operating Environment](#)  
Tom Overbye

[A Comparison of the Results of Three Auction Experiments](#)  
Robert J. Thomas, Timothy D. Mount, Ray D. Zimmerman and Carlos Murillio-Sanchez

[Designing and Testing Markets for Electricity and its Ancillary Services: What we do and how it's done.](#)  
Robert J. Thomas

[Electric Power Transmission: Research Needs to Sustain a Critical National Infrastructure](#)  
Robert J. Thomas

[Monitoring Electric Power Markets: The Role of the Electric Grid](#)  
Robert J. Thomas

[Back to Table of Contents](#)

## **PSERC Research Tele-Seminar Slides 2006-2008**

(click on the folder title above to view the current list of documents in this web site folder)

The table below lists the monthly Research Seminars that were offered to PSERC members from January 2006 through 2008. Presentation slides from the seminars can be viewed by clicking on the seminar titles below.

<u>Date</u>	<u>Seminar</u>
Nov. 4, 2008	<b>A SuperOPF Framework for Improved Allocation and Valuation of System Resources through Co-optimization</b> (08-14) Ray Zimmerman
Oct. 7, 2008	<b>The Key Role of Network Systems Engineering in Meeting the Energy and Environment Dream</b> (08-12) Marija Ilic
Sept. 2, 2008	<b>The Effects of Greenhouse Gas Limits on Electric Power System Dispatch and Operations</b> (08-10) Miaolei Shao
June 17, 2008	<b>PMU-Enabled Distributed State Estimation with the SuperCalibrator</b> (08-09) Sakis Meliopoulos
May 6, 2008	<b>Demand Response via Real-Time Pricing to Increase Use of Operational Wind Energy Generators</b> (08-07) Ramteen Sioshansi
Apr. 1, 2008	<b>Designing CO2 Trading Markets for the Power Sector: Does It Matter Who Gets the Allowances and Who Must Comply?</b> (08-05) Benjamin F. Hobbs
Mar. 4, 2008	<b>The Efficiency of Uniform-Price Electricity Auctions: Evidence from Bidding Behavior in ERCOT</b> (08-03) Steve Puller
Feb. 5, 2008	<b>Agent-Based Test Beds for Power Industry Research, Teaching and Training</b> (08-01) Leigh Tesfatsion
Dec. 4, 2007	<b>The Case for Plug-In Hybrid Electric Vehicles</b> (07-10) Jerome Meisel

<u>Date</u>	<u>Seminar</u>
Nov. 6, 2007	<b>Requirements and Mechanisms for Flexible and Robust Inter-Utility Data Sharing</b> (07-09) Dave Bakken
Oct. 2, 2007	<b>Integration of Renewable Resources</b> (07-07) David Hawkins
Sep. 4, 2007	<b>Use of Composite Materials for High Temperature, Low Sag Conductors</b> (07-06) Ravi Gorur
June 5, 2007	<b>The Electric Power Industry and Climate Change: Power Systems Research Possibilities</b> (07-05) Judy Cardell and Tom Overbye
May 1, 2007	<b>Models for Electric Transmission Property Rights</b> (07-04) Ross Baldick
Apr. 3, 2007	<b>Nuclear Energy Renaissance in the U.S.</b> (07-03) Jasmina Vujic
Mar. 6, 2007	<b>The Reliability Assessment Project</b> (07-02) George Gross
Feb. 6, 2007	<b>Electric Power Industry in China</b> (07-01) Hui Ren
Dec. 12, 2006	<b>Markets for Reactive Power and Reliability</b> (06-14) William Schulze
Dec. 5, 2006	<b>Carbon and Climate Issues for the Electric Power Sector</b> (06-13) Jay Apt
Nov. 7, 2006	<b>Optimizing Power System Restoration Resources and Actions</b> (06-12) Chen-Ching Liu
Oct. 4, 2006	<b>Toward Optimal Operations</b> (06-11) Paul Hines
Sept. 5, 2006	<b>Risk-Based Resource Allocation for Distribution System Maintenance</b> (06-10) James McCalley and Ward Jewell
May 16, 2006	<b>Trying to Maintain Generation Adequacy in “Deregulated” Markets</b> (06-09) Tim Mount

<u>Date</u>	<u>Seminar</u>
May 2, 2006	<b>Detecting Circuit Breaker Status Errors in Substations</b> (06-08) Ali Abur
Apr. 24, 2006	<b>The Threat of Hacking with Megawatts</b> Chris DeMarco (Webstreaming)
Apr. 18, 2006	<b>Security Enhancement through Direct Non-Disruptive Load Control</b> (06-07) Ian Hiskens and Vijay Vittal
Apr. 10, 2006	<b>Nuclear Energy: 1996, 2006, 2016</b> Per Peterson (Webstreaming)
Apr. 4, 2006	<b>Wide-Area Small-Signal Stability Controller</b> (06-06) Mani Venkatasubramanian
Mar. 28, 2006	<b>Real-Time Monitoring of Cascading Events</b> (06-05) Mladen Kezunovic
Mar. 21, 2006	<b>Adaptive Islanding to Prevent Cascading Failure Events</b> (06-04) Vijay Vittal
Feb. 21, 2006	<b>Effects of Voltage Sags on Household Loads</b> (06-03) George Karady
Feb. 7, 2006	<b>Generation Adequacy via Call Options Obligations: Safe Passage to the Promised Land</b> (06-02) Shmuel Oren
Jan. 24, 2006	<b>Visualization of Power Systems and Components</b> (06-01) Tom Overbye

[Back to Table of Contents](#)

## **PSERC Research Tele-Seminar Slides 2000-2005**

(click on the folder title above to view the current list of documents in this web site folder)

The table below lists the monthly Research Seminars that were offered to PSERC members from September 2000 to December 2005. Presentation slides from the seminars can be viewed by clicking on the seminar titles below.

<b><u>Date</u></b>	<b><u>Seminar</u></b>
<b>Nov. 22, 2005</b>	<b>Optimal Placement of Phasor Measurement Units for State Estimation</b> (05-11) Ali Abur
<b>Nov. 1, 2005</b>	<b>Cyber Security and Control System Survivability: Technical and Policy Challenges</b> (05-10) Howard Lipson
<b>Oct. 4, 2005</b>	<b>Uses of Substation IED Data for Improved Operation and Maintenance</b> (05-09) Mladen Kezunovic
<b>Sept. 6, 2005</b>	<b>Preventing Blackouts by Means of Enhanced Control: From Complexity to Order</b> (05-08) Marija Ilic
<b>Jun. 7, 2005</b>	<b>MicroGrid Control</b> (05-07) Paolo Piagi
<b>May 3, 2005</b>	<b>Final Report on the On-Line Transient Stability Assessment Scoping Study</b> (05-06) Vijay Vittal
<b>Apr. 5, 2005</b>	<b>Transmission Planning and Investment in the Competitive Environment</b> (05-05) George Gross
<b>Mar. 30, 2005</b>	<b>Market Design and Gaming in Competitive Electricity Markets</b> (05-04) Shmuel Oren
<b>Feb. 24, 2005</b>	<b>Technical and Policy Considerations for Broadband Power Line (BPL) Communication</b> (05-03) Robert Olsen
<b>Jan. 31, 2005</b>	<b>Blackout Risk, Cascading Failure and Complex Systems Dynamics</b> (05-02) Ian Dobson

<u>Date</u>	<u>Seminar</u>
Jan. 21, 2005	<b>A Technical Discussion of the Events Surrounding the August 14, 2003, Northeast Blackout</b> (05-01) David W. Hilt
Dec. 14, 2004	<b>Optimal Bidding Strategies in Electricity Markets</b> (04-10) Rajesh Rajaraman
Nov. 9, 2004	<b>Integrating Wind Energy in the Australian National Electricity Market</b> (04-09) Hugh Outhred
Nov. 2, 2004	<b>Structuring Electricity Markets for Demand Responsiveness: Experiments on Efficiency and Operational Consequences</b> (04-08) Richard E. Schuler, Cornell University
Oct. 5, 2004	<b>Metering, Smart Metering, and Distribution Control – An Analysis</b> (04-07) Rahul Tongia
Sept. 7, 2004	<b>Power System Neutral/Ground Voltages: Causes, Safety Concerns and Mitigation</b> (04-06) Sakis Meliopoulos, Georgia Tech
July 7, 2004	<b>Development of Simple Diagnostic Tool for Detecting Insulators with Contamination Problems</b> (04-05) Ravi Gorur
Apr. 30, 2004	<b>Role of GPS Synchronized Measurements in Power System Visibility</b> (04-04) Sakis Meliopoulos, Georgia Tech
Apr. 6, 2004	<b>Evaluating Protective Relay Operation Through Testing</b> (04-03) Mladen Kezunovic, Eugene E. Webb Professorship in Electrical Engineering, Texas A&M University
Mar. 2, 2004	<b>New Tools for Analyzing Power System Dynamics</b> (04-02) Ian Hiskens, Professor of Electrical and Computer Engineering University of Wisconsin-Madison
Feb. 3, 2004	<b>Deregulating Electricity Markets: Naïve Hopes vs. Market Reality</b> (04-01) Lester Lave, Professor of Graduate School of Industrial Administration and Engineering and Public Policy Carnegie Mellon University

<u>Date</u>	<u>Seminar</u>
Dec. 2, 2003	<b>Power Acceptability</b> G.T. Heydt, Regents' Professor and Professor of Electrical Engineering Arizona State University
Nov. 4, 2003	<b>Assessment of Transmission Congestion Impacts on Electricity Markets</b> George Gross, Professor of Electrical and Computer Engineering University of Illinois at Urbana-Champaign
Oct. 7, 2003	<b>Operational Defense of Power System Cascading Sequences: Probability, Prediction, and Mitigation</b> Jim McCalley, School of Electrical and Computer Engineering, Iowa State University
Sept. 2, 2003	<b>The Influence of Large-Scale Wind-Power on Global Climate</b> David Keith, Department of Electrical Engineering and Public Policy Carnegie Mellon University
June 26, 2003	<b>Lectures for Thursday, July 26</b> Morning: Distribution STATCOM, Dynamic Voltage Restorer (DVR), and Unified Power Quality Conditioner (UPQC) Arindam Ghosh, Department of Electrical Engineering Indian Institute of Technology
June 25, 2003	<b>Lectures for Wednesday, July 25</b> Morning: Power Quality associated with power distribution systems Afternoon: Network reconfiguring devices like Static Current Limiter (SCL), Static Circuit Breaker (SCB) and Static Transfer Switch (STS) Arindam Ghosh, Department of Electrical Engineering Indian Institute of Technology
June 24, 2003	<b>Lectures for Tuesday, June 24</b> Morning: Series compensation of transmission systems – ideal compensator, TCSC, SSSC Afternoon: Other FACTS controllers – UPFC, dynamic brake, phase angle regulation Arindam Ghosh, Department of Electrical Engineering Indian Institute of Technology
June 23, 2003	<b>Lectures for Monday, June 23</b> Morning: Problems associated with bulk power transmission systems Afternoon: Shunt compensation of transmission systems – ideal compensator, TSC, TCR, STATCOM Arindam Ghosh, Department of Electrical Engineering Indian Institute of Technology
June 3, 2003	<b>Condition Assessment of Polymer Insulators</b> Ravi Gorur, School of Electrical Engineering Arizona State University
Apr. 1, 2003	<b>Valuation of Congestion Revenue Rights Based on Power Market Simulation Models</b> Shijie Deng, School of Industrial and Systems Engineering Georgia Tech

<u>Date</u>	<u>Seminar</u>
Mar. 4, 2003	<b>Locational Pricing and Scheduling for an Integrated Energy-Reserve Market</b> James S. Thorp and Timothy D. Mount Cornell University
Feb. 4, 2003	<b>Mean--Variance Portfolio Selection with Random Parameters</b> Andrew Lim, Industrial Engineering and Operations Research Department, University of California, Berkeley
Jan. 21, 2003	<b>Automatic Slow Voltage Controller for Large Power Systems</b> Mani V. Venkatasubramanian Professor, Electrical Engineering and Computer Science Washington State University
Dec. 3, 2002	<b>Reactive Power Considerations in Linear Load Flow with Applications to Available Transfer Capability</b> <i>Peter W. Sauer, Professor and Interim PSERC Director</i> <i>Dept. of Electrical and Computer Engineering</i> <i>University of Illinois at Urbana-Champaign</i>
Nov. 5, 2002	<b>Advanced Monitoring System for Health Assessment of Overhead Transmission Lines</b> <i>Rahmat Shoureshi,</i> <i>G.A. Dobelman Distinguished Chair Professor</i> <i>Colorado School of Mines</i>
Oct. 1, 2002	<b>Self-Healing in Power Systems: An Approach Using Islanding and Rate of Frequency Decline Based Load Shedding</b> <i>Vijay Vittal, Harpole Professor</i> <i>Department of Electrical and Computer Engineering</i> <i>Iowa State University</i>
Sep. 3, 2002	<b>Distribution Harmonic Issues: Telephone Noise</b> <i>Ward Jewell, Professor of Electrical Engineering</i> <i>Wichita State University</i>
Apr. 2, 2002	<b>On-Line Transient Stability and Voltage Collapse Prediction Using Multi-Agent Technique</b> <i>George Karady, Professor</i> <i>School of Electrical Engineering, Arizona State University</i>
Mar. 5, 2002	<b>Power Quality Assessment via Physically Based Modeling*</b> <i>Sakis Meliopoulos, Professor</i> <i>Faculty of Electrical Engineering, Georgia Institute of Technology</i>
Feb. 6, 2002	<b>A Zero-Reflection Controller for Electromechanical Disturbances in Power Networks</b> <i>Bernie Leshtre, Visiting Associate Professor</i> <i>School of Electrical and Computer Engineering</i> <i>Cornell University</i>

<u>Date</u>	<u>Seminar</u>
Jan. 1, 2002	<b>Growth Chemistry and Its Relationship to Amorphous Si Devices for Photovoltaic Energy Conversion</b> <i>Vikram L. Dalal, Professor of Electrical and Computer Engineering Iowa State University</i>
Nov. 6, 2001	<b>Understanding Direct Lightning Stroke Shielding of Substations</b> <i>P.K. Sen, Professor Division of Engineering Colorado School of Mines</i>
Oct. 2, 2001	<b>Distributed Generation and Path Dependency*</b> <i>Neil Strachan, Post Doctoral Research Fellow Electricity Industry Center</i>
Oct. 2, 2001	<b>Electricity and Conflict: An Evaluation of Distributed Co-Generation as a Reliable Solution*</b> <i>Hisham Zerriffi, Doctoral Student Engineering and Public Policy Carnegie Mellon University</i>
Sept. 11, 2001	<b>Use of Planning Studies to Estimate Security Margins in Real-Time*</b> <i>Kevin Tomsovic, Associate Professor School of Electrical Engineering and Computer Science Washington State University – Pullman</i>
Apr. 24, 2001	<b>Designing Telecommunication Networks</b> <i>Alper Atamturk, Assistant Professor Department of Industrial Engineering and Operations Research University of California – Berkeley</i>
Apr. 3, 2001	<b>A Bi-Stable Line Outage Model for Stochastic Studies of Cascading Power System Failure</b> <i>Christopher L. DeMarco, Professor Department of Electrical and Computer Engineering University of Wisconsin – Madison</i>
Mar. 6, 2001	<b>The Future Of Distribution Systems in the Deregulated Environment: Opportunities and Challenges</b> <i>S. S. Venkata, Professor and Chair Department of Electrical and Computer Engineering Iowa State University, Ames</i>
Feb. 20, 2001	<b>Black and Blue: The California Electricity Restructuring Saga</b> <i>George Gross, Department of Electrical and Computer Engineering University of Illinois</i>
Feb. 13, 2001	<b>Harmonics in Low-Voltage Three-phase Four-Wire Electric Distribution Systems and Filtering Solutions</b> <i>Prasad Enjeti, Department of Electrical Engineering Texas A&amp;M University</i>

<u>Date</u>	<u>Seminar</u>
Jan. 23, 2001	<b>Incorporating Physical Constraints and Transaction Costs into Option-Based Valuation of Real Assets</b> <i>Shijie Deng, Industrial and Systems Engineering Georgia Institute of Technology</i>
	<i>Shmuel Oren, Industrial Engineering and Operations Research University of California at Berkeley</i>
Dec. 5, 2000	<b>Utility Application of Fiber Optic Cable</b> <i>Dr. George Karady, Department of Electrical Engineering Arizona State University</i>
Nov. 7, 2000	<b>Efficient Available Transfer Capability Analysis Using Linear Methods</b> <i>Jamie Weber PowerWorld Corporation</i>
Oct. 3, 2000	<b>Are Price Spikes in Electricity Markets Predictable, Reproducible, and Avoidable?</b> <i>Timothy D. Mount Cornell University</i>
Sept. 5, 2000	<b>Security Assessment: Decision Support Tools for Power System Operators</b> <i>J. D. McCalley Iowa State University</i>

[Back to Table of Contents](#)

## **PSERC Research Seminar Audio-Slide Productions 2006-2008**

Research seminars from 2006 through 2008 can be viewed as narrated slide files. You will be able listen to and watch the presentation as if you were on-line when the presentation was made. The seminars for which these presentations have been prepared are given below. You have the choice of playing the streaming audio files over the Internet or downloading each seminar's zipped files.

<u>Date</u>	<u>Seminar</u>
Nov. 18, 2008	<b>Integration of Operational and Non-Operational Data for Improved EMS Monitoring (Project T-32, Part I)</b> (08-15) Mladen Kezunovic ( <a href="#">Webstreaming</a>   Download for members only)
Nov. 4, 2008	<b>A SuperOPF Framework for Improved Allocation and Valuation of System Resources through Co-optimization</b> (08-14) Ray Zimmerman ( <a href="#">Webstreaming</a>   Download for members only)
Oct. 28, 2008	<b>Wide-Area Measurement-Based Detection and Remedial Control Actions (Project S-29, Part II)</b> (08-13) Mani V. Venkatasubramanian ( <a href="#">Webstreaming</a>   Download for members only)
Oct. 7, 2008	<b>The Key Role of Network Systems Engineering in Meeting the Energy and Environment Dream</b> (08-12) Marija Ilic ( <a href="#">Webstreaming</a>   Download for members only)
Sept. 16, 2008	<b>Incenting Transmission Reliability and Adequacy Related Investments (Project M-11)</b> (08-11) Shijie Deng ( <a href="#">Webstreaming</a>   Download for members only)
Sept. 2, 2008	<b>The Effects of Greenhouse Gas Limits on Electric Power System Dispatch and Operations</b> (08-10) Miaolei Shao ( <a href="#">Webstreaming</a>   Download for members only)
June 17, 2008	<b>PMU-Enabled Distributed State Estimation with the SuperCalibrator</b> (08-09) Sakis Meliopoulos ( <a href="#">Webstreaming</a>   Download for members only)

<u>Date</u>	<u>Seminar</u>
June 3, 2008	<b>Effective Power System Control Center Visualization (Project S-25)</b> (08-08) Tom Overbye ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
May 6, 2008	<b>Demand Response via Real-Time Pricing to Increase Use of Operational Wind Energy Generators</b> (08-07) Ramteen Sioshansi ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Apr. 1, 2008	<b>Designing CO2 Trading Markets for the Power Sector: Does It Matter Who Gets the Allowances and Who Must Comply?</b> (08-05) Benjamin F. Hobbs ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Mar. 4, 2008	<b>The Efficiency of Uniform-Price Electricity Auctions: Evidence from Bidding Behavior in ERCOT</b> (08-03) Steve Puller ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Feb. 5, 2008	<b>Agent-Based Test Beds for Power Industry Research, Teaching and Training</b> (08-01) Leigh Tesfatsion ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Dec. 4, 2007	<b>The Case for Plug-In Hybrid Electric Vehicles</b> (07-10) Jerome Meisel ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Nov. 6, 2007	<b>Requirements and Mechanisms for Flexible and Robust Inter-Utility Data Sharing</b> (07-09) Dave Bakken ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Oct. 2, 2007	<b>Integration of Renewable Resources</b> (07-07) David Hawkins ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Sept. 4, 2007	<b>Use of Composite Materials for High Temperature, Low Sag Conductors</b> (07-06) Ravi Gorur ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )

<u>Date</u>	<u>Seminar</u>
June 5, 2007	<b>The Electric Power Industry and Climate Change: Power Systems Research Possibilities</b> (07-05) Judy Cardell and Tom Overbye ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
May 1, 2007	<b>Models for Electric Transmission Property Rights</b> (07-04) Ross Baldick, University of Texas at Austin ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Apr. 3, 2007	<b>Nuclear Energy Renaissance in the U.S.</b> (07-03) Jasmina Vujic, University of California Berkeley ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Mar. 6, 2007	<b>The Reliability Assessment Project</b> (07-02) George Gross, University of Illinois Urbana-Champaign ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Feb. 6, 2007	<b>Electric Power Industry in China</b> (07-01) Hui Ren, North China Electric Power University ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Dec. 12, 2006	<b>Markets for Reactive Power and Reliability</b> (06-14) William Schulze, Cornell University ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Dec. 5, 2006	<b>Carbon and Climate Issues for the Electric Power Sector</b> (06-13) Jay Apt, Carnegie Mellon University ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Nov. 7, 2006	<b>Optimizing Power System Restoration</b> (06-12) Chen-Ching Liu ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Oct. 3, 2006	<b>Toward Optimal Operations</b> (06-11) Paul Hines ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Sept. 5, 2006	<b>Risk-Based Resource Allocation for Distribution System Maintenance</b> (06-10) Ward Jewell and Jim McCalley ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
May 16, 2006	<b>Trying to Maintain Generation Adequacy in “Deregulated” Markets</b> (06-09) Tim Mount ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )

<u>Date</u>	<u>Seminar</u>
May 2, 2006	<b>Detecting Circuit Breaker Status Errors in Substations</b> (06-08) Ali Abur ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Apr. 24, 2006	<b>The Threat of Hacking with Megawatts</b> Chris DeMarco ( <a href="#">Webstreaming</a> )
Apr. 18, 2006	<b>Security Enhancement through Direct Non-Disruptive Load Control</b> (06-07) Ian Hiskens and Vijay Vittal ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Apr. 10, 2006	<b>Nuclear Energy: 1996, 2006, 2016</b> Per Peterson ( <a href="#">Webstreaming</a> )
Apr. 4, 2006	<b>Wide-Area Small-Signal Stability Controller</b> (06-06) Mani Venkatasubramanian ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Mar. 28, 2006	<b>Real-Time Monitoring of Cascading Events</b> (06-05) Mladen Kezunovic ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Mar. 21, 2006	<b>Adaptive Islanding to Prevent Cascading Failure Events</b> (06-04) Vijay Vittal ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Feb. 21, 2006	<b>Effects of Voltage Sags on Household Loads</b> (06-03) George Karady ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Feb. 7, 2006	<b>Generation Adequacy via Call Options Obligations: Safe Passage to the Promised Land</b> (06-02) Shmuel Oren ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )
Jan. 24, 2006	<b>Visualization of Power Systems and Components</b> (06-01) Tom Overbye ( <a href="#">Webstreaming</a>   <a href="#">Download for members only</a> )

[Back to Table of Contents](#)

## **PSERC Research Seminar Audio-Slide Productions 2003-2005**

Selected research seminars can be viewed as narrated slide files. You will be able listen to and watch the presentation as if you were on-line when the presentation was made. The seminars for which these presentations have been prepared are given below. You have the choice of playing the streaming seminar files over the Internet or downloading each seminar's zipped files.

### **Narrated Slide Files Viewable with the Windows Media Player Viewer**

<b><u>Date</u></b>	<b><u>Seminar</u></b>
<b>Oct. 4, 2005</b>	<b>Uses of Substation IED Data for Improved Operation and Maintenance</b> (05-09) Mladen Kezunovic
<b>Sept. 6, 2005</b>	<b>Preventing Blackouts by Means of Enhanced Control: From Complexity to Order</b> (05-08) Marija Ilic
<b>June 7, 2005</b>	<b>MicroGrid Control</b> (05-07) Paolo Piagi
<b>May 3, 2005</b>	<b>Final Report on the On-Line Transient Stability Assessment Scoping Study</b> (05-06) Vijay Vittal
<b>Apr. 5, 2005</b>	<b>Transmission Planning and Investment in the Competitive Environment</b> (05-05) George Gross
<b>Mar. 30, 2005</b>	<b>Market Design and Gaming in Competitive Electricity Markets</b> (05-04) Shmuel Oren
<b>Feb. 24, 2005</b>	<b>Technical and Policy Considerations for Broadband Power Line (BPL) Communication</b> (05-03) Robert Olsen
<b>Jan. 31, 2005</b>	<b>Blackout Risk, Cascading Failure and Complex Systems Dynamics</b> (05-02) Ian Dobson
<b>Jan. 21, 2005</b>	<b>A Technical Discussion of the Events Surrounding the August 14, 2003, Northeast Blackout</b> (05-01) David Hilt, VP-Compliance, NERC
<b>Dec. 14, 2004</b>	<b>Optimal Bidding Strategies in Electricity Markets</b> (04-10) Rajesh Rajaraman

<u>Date</u>	<u>Seminar</u>
Nov. 9, 2004	<b>Integrating Wind Energy in the Australian National Electricity Market</b> (04-09) Hugh Outhred
Nov. 2, 2004	<b>Structuring Electricity Markets for Demand Responsiveness: Experiments on Efficiency and Operational Consequences</b> (04-08) Richard E. Schuler
Oct. 4, 2004	<b>Metering, Smart Metering, and Distribution Control – An Analysis</b> (04-07) Rahul Tongia
Sept. 7, 2004	<b>Power System Neutral/Ground Voltages: Causes, Safety Concerns and Mitigation</b> (04-06) Sakis Meliopoulos, Georgia Tech
July 7, 2004	<b>Development of Simple Diagnostic Tool for Detecting Insulators with Contamination Problems</b> (04-05) Ravi Gorur
Apr. 30, 2004	<b>Role of GPS Synchronized Measurements in Power System Visibility</b> (04-04) Sakis Meliopoulos, Georgia Tech
Apr. 6, 2004	<b>Evaluating Protective Relay Operation Through Testing</b> (04-03) Mladen Kezunovic, Eugene E. Webb Professorship in Electrical Engineering, Texas A&M University
Mar. 2, 2004	<b>New Tools for Analyzing Power System Dynamics</b> (04-02) Ian Hiskens, Professor of Electrical and Computer Engineering University of Wisconsin-Madison
Feb. 3, 2004	<b>Deregulating Electricity Markets: Naïve Hopes vs. Market Reality</b> (04-01) Lester Lave, Professor of Graduate School of Industrial Administration and Engineering and Public Policy Carnegie Mellon University
Dec. 2, 2003	<b>Power Quality</b> (03-07) G.T. Heydt, Regents' Professor and Professor of Electrical Engineering Arizona State University
Nov. 4, 2003	<b>Assessment of Transmission Congestion Impacts on Electricity Markets</b> (03-06) George Gross, Professor of Electrical and Computer Engineering University of Illinois at Urbana-Champaign

<u>Date</u>	<u>Seminar</u>
Oct. 7, 2003	<b>Operational Defense of Power System Cascading Sequences: Probability, Prediction, and Mitigation</b> (03-05) Jim McCalley, School of Electrical and Computer Engineering, Iowa State University
June 26, 2003	Morning: <b>Distribution STATCOM, Dynamic Voltage Restorer (DVR), and Unified Power Quality Conditioner (UPQC)</b> Arindam Ghosh, Department of Electrical Engineering Indian Institute of Technology
June 25, 2003	Morning: <b>Power Quality associated with power distribution systems</b> Afternoon: <b>Network reconfiguring devices like Static Current Limiter (SCL), Static Circuit Breaker (SCB) and Static Transfer Switch (STS)</b> Arindam Ghosh, Department of Electrical Engineering Indian Institute of Technology
June 24, 2003	Morning: <b>Series compensation of transmission systems – ideal compensator, TCSC, SSSC</b> Afternoon: <b>Other FACTS controllers – UPFC, dynamic brake, phase angle regulation</b> Arindam Ghosh, Department of Electrical Engineering Indian Institute of Technology
June 23, 2003	Morning: <b>Problems associated with bulk power transmission systems</b> Afternoon: <b>Shunt compensation of transmission systems – ideal compensator, TSC, TCR, STATCOM</b> Arindam Ghosh, Department of Electrical Engineering Indian Institute of Technology
June 3, 2003	<b>Condition Assessment of Polymer Insulators</b> (03-04) Ravi Gorur, School of Electrical Engineering Arizona State University
Apr. 1, 2003	<b>Valuation of Congestion Revenue Rights Based on Power Market Simulation Models</b> (03-03) Shijie Deng, School of Industrial and Systems Engineering Georgia Tech
Mar. 4, 2003	<b>Locational Pricing and Scheduling for an Integrated Energy-Reserve Market</b> (03-02) James S. Thorp and Timothy D. Mount Cornell University
Jan. 21, 2003	<b>Automatic Slow Voltage Controller for Large Power Systems</b> (03-01) Mani V. Venkatasubramanian Professor, Electrical Engineering and Computer Science Washington State University

**Illustrated Audio Files Viewable with the RealPlayer Viewer:**

<u>Date</u>	<u>Seminar</u>
Apr. 2, 2002	<b>On-Line Transient Stability and Voltage Collapse Prediction Using Multi-Agent Technique</b> <i>George Karady, Professor</i> <i>School of Electrical Engineering, Arizona State University</i>
Mar. 5, 2002	<b>Power Quality Assessment via Physically Based Modeling</b> <i>Sakis Meliopoulos, Professor</i> <i>Faculty of Electrical Engineering, Georgia Institute of Technology</i>
Oct. 2, 2001	<b>Distributed Generation and Path Dependency</b> <i>Neil Strachan, Post Doctoral Research Fellow</i> <i>Electricity Industry Center</i>
	<b>Electricity and Conflict: An Evaluation of Distributed Co-Generation as a Reliable Solution</b> <i>Hisham Zerriffi, Doctoral Student</i> <i>Engineering and Public Policy</i> <i>Carnegie Mellon University</i>
Sept. 11, 2001	<b>Use of Planning Studies to Estimate Security Margins in Real-Time</b> <i>Kevin Tomsovic, Associate Professor</i> <i>School of Electrical Engineering and Computer Science</i> <i>Washington State University – Pullman</i>

[Back to Table of Contents](#)

## **Markets Reports and Selected Publications**

### **Reports**

08-17

[Agent Modeling for Integrated Power Systems](#)

Chen-Ching Liu

08-16

[Evaluation of Alternative Market Structure and Compensation Schemes for Incenting Transmission Reliability and Adequacy Related Investments](#)

Shijie Deng

08-14

[Reliability, Electric Power, and Public vs. Private Goods: A New Look at the Role of Markets](#)

William Schulze

07-17

[Uncertain Power Flows and Transmission Planning](#)

Gerry Heydt and Peter Sauer

07-16

[The Electric Power Industry and Climate Change: Power Systems Research Possibilities](#)

Tom Overbye, Project Leader

07-02

[Modeling Market Signals for Transmission Adequacy Issues: Valuation of Transmission Facilities and Load Participation Contracts in Restructured Electric Power Systems](#)

Shi-Jie Deng

07-01

[Reliability Assessment Incorporating Operational Considerations and Economic Aspects for Large Interconnected Grids](#)

George Gross

05-55

[Market Redesign: Incorporating the Lessons Learned for Enhancing Market Design](#)

Shmuel Oren, Project Leader

05-37

[Software Agents for Market Design and Analysis](#)

Sarosh Talukdar, Project Leader

04-33

[Structuring Electricity Markets for Demand Responsiveness: Experiments on Efficiency and Operational Consequences](#)

Richard E. Schuler

03-33

[Interval Analysis for Unknown Dependencies and Genetic Algorithm Emulation of Markets – Market Interactions and Market Power](#)  
Gerald B. Sheblé (Project Leader)

03-05

[Optimal Bidding Strategy in Electricity Markets Under Uncertain Energy and Reserve Prices](#)  
Rajesh Rajaraman and Fernando Alvarado

02-42

[Market Mechanisms for Competitive Electricity](#)  
Shmuel Oren (Project Leader)

00-08

[Reactive Power Support Services in Electricity Markets](#)  
Sauer, Overbye, Gross, Alvarado, Oren and Momoh

## **Markets - Selected Publications**

06-36

[Economic Criteria for Planning Transmission Investment in Restructured Electricity Markets](#)  
Enzo E. Sauma and Shmuel S. Oren

06-28

[Cournot Equilibrium in Two-settlement Electricity Markets: Formulation and Computation](#)  
Jian Yao

06-19

[Modeling and Computing Two-settlement Oligopolistic Equilibrium in a Congested Electricity Network](#)  
Jian Yao, Ilan Adler, and Shmuel S. Oren

06-13

[How Good are Supply Function Equilibrium Models: An Empirical Analysis of the ERCOT Balancing Market](#)  
Ramteen Sioshansi and Shmuel S. Oren

06-09

[An Analytical Framework for Short-Term Resource Adequacy in Competitive Electricity Markets](#)  
Pablo A. Ruiz and George Gross

06-05

[An Energy Reference Bus Independent LMP Decomposition Algorithm](#)  
Xu Cheng and Tom Overbye

05-71

**A Method for Classifying Offer Strategies Observed in an Electricity Market**  
HyungSeon Oh, Robert J. Thomas, Bernard C. Lesieutre, Timohty D. Mount

05-67

**Volumetric Hedging in Electricity Procurement**  
Yumi Oum, Shmuel Oren and Shijie Deng

05-66

**Optimal Market Grain Over Space and Time**  
Nodir Adilov and Richard E. Schuler

05-55

**Market Redesign: Incorporating the Lessons Learned for Enhancing Market Design**  
Shmuel Oren, Project Leader

05-54

**Electricity Markets: How Many, Where and When?**  
Nodir Adilov and Richard E. Schuler

05-50

**Two-Sided Electricity Markets: Self-Healing Systems**  
Richard E. Schuler

05-46

**Interface between Engineering and Market Operations in Restructured Electricity Systems**  
Hung-po Chao, Shmuel Oren, Alex Papalexopoulos, Dejan Sobajic, and Robert Wilson

05-40

**Convexity of the Set of Feasible Injections and Revenue Adequacy in FTR Markets**  
Bernard C. Lesieutre and Ian A. Hiskens

05-11

**Hedging Quantity Risks with Standard Power Options in a Competitive Wholesale Electricity Market**  
Yumi Oum and Shmuel Oren

05-08

**Electricity Derivatives and Risk Management**  
Shi-Jie Deng and Shmuel Oren

05-05

**Cournot Equilibria in Two-Settlement Electricity Markets with System Contingencies**  
Jian Yao, Shmuel S. Oren, and Ilan Adler

04-59

**Identifying the Potential for Market Power in Electric Power Systems in Real-Time**  
A. Kian, R. Thomas, R. Zimmerman, B. Lesieutre, T. Mount

04-58

[PowerWeb: A Tool for Evaluating Economic and Reliability Impacts of Electric Power Market Designs](#)

Ray D. Zimmerman, and Robert J. Thomas

04-57

[Market Efficiency, Competition, and Communication in Electric Power Markets: Experimental Results](#)

D. Chapman, C. Vossler, T. Mount, V. Barboni, R. Thomas, R. Zimmerman

04-56

[PowerWeb Testing of Various Auction Clearing Mechanisms for Electricity](#)

Robert J. Thomas, Timothy D. Mount, Ray D. Zimmerman

04-55

[Role of Distribution Factors in Congestion Revenue Rights](#)

Minghai Liu and George Gross

04-54

[Evolving Nature of Electricity Market Design in the U.S.](#)

George Gross

04-52

[Protecting the Market from “Hockey Stick” Pricing: How the Public Utility Commission of Texas is Dealing with Potential Price Gouging](#)

David Hurlbut, Keith Rogas and Shmuel Oren

04-45

[Testing the Effects of Holding Forward Contracts On the Behavior of Suppliers in an Electricity Auction](#)

Hyungna Oh and Tim Mount

04-42

[Market Structure and the Predictability of Electricity System Line Flows: An Experimental Analysis](#)

Nodir Adilov, Thomas Light, Richard Schuler, William Schulze, David Toomey, and Ray Zimmerman

04-40

[Cournot Equilibrium in Price-capped Two-Settlement Electricity Markets](#)

Jian Yao, Bert Willems, Shmuel S. Oren, and Ilan Adler

04-38

[On the Efficiency of the New York Independent System Operator Market for Transmission Congestion Contracts](#)

Afzal S. Siddiqui, Emily S. Bartholomew, Chris Marnay, and Shmuel S. Oren

04-36

[Self-Regulating Markets for Electricity: Letting Customers into the Game](#)

Richard E. Schuler

04-24

[Self-Regulating Electricity Markets?](#)

Nodir Adilov, Thomas Light, Richard Schuler, William Schulze, David Toomey and Ray Zimmerman

04-21

[Metrics for Application of Revenue Sensitivity Analysis to Predict Market Power Coalitions in Electricity Markets](#)

Mary Cain and Fernando Alvarado

04-19

[Computing Cournot Equilibria in Two Settlement Electricity Markets with Transmission Constraints](#)

Jian Yao, Shmuel S. Oren, Ilan Adler

04-18

[Framework for the Design and Analysis of Congestion Revenue Rights](#)

Minghai Liu and George Gross

04-17

[Competitive Acquisition of Prioritizable Capacity-Based Ancillary Services](#)

Gianfranco Chicco and George Gross

04-15

[An Efficient Procedure For The Rational Buyer Approach For The Acquisition Of Capacity-Based Ancillary Services](#)

Gianfranco Chicco and George Gross

04-14

[The Impact of Uncertainty on Incentives to Collude in Electricity Markets](#)

Mary B. Cain and Fernando L. Alvarado

04-06

[Implications of Cost and Bid Format on Electricity Market Studies: Linear Versus Quadratic Costs](#)

Mary Cain and Fernando Alvarado

03-40

[Comparing the Behavior of Agents to Human Subjects in a Uniform Price Auction](#)

H. Oh, R. Thomas, B. Leiseutre, T. Mount

03-39

[\*\*A Revenue Sensitivity Approach for the Identification and Quantification of Market Power in Electric Energy Markets\*\*](#)

B. Lesieurte, R. Thomas, T. Mount

03-38

[\*\*The Effects of the Dysfunctional Spot Market for Electricity in California on the Cost of Forward Contracts\*\*](#)

T. Mount, Y.-S. Lee

03-36

[\*\*Converting System Limits to Market Signals\*\*](#)

Fernando Alvarado

03-34

[\*\*The New York Transmission Congestion Contract Market: Is It Truly Working Efficiently?\*\*](#)

Emily S. Bartholomew, Afzal S. Siddiqui, Chris Marnay, and Shmuel S. Oren

03-33

[\*\*The Inherent Inefficiency of the Point-to-Point Congestion Revenue Right Auction\*\*](#)

Shi-Jie Deng, Shmuel Oren, and Sakis Meliopoulos

03-25

[\*\*The Effect of Customer Participation in Electricity Markets: An Experimental Analysis of Alternative Market Structures\*\*](#)

Richard E. Schuler, William D. Schulze, Nodir Adilov and David Toomey

03-22

[\*\*Coordinated Interchange Scheduling and Opportunity Cost Payment: A Market Proposal to Seams Issues\*\*](#)

Jie Chen, James S. Thorp and Timothy D. Mount

03-21

[\*\*The influence of futures markets on real time price stabilization in electricity markets\*\*](#)

David Watts and Fernando L. Alvarado

03-16

[\*\*An Interactive - Dynamic Mechanism Conceptualizing the Cost and Benefit of Electric Power Quality\*\*](#)

Geun-Joon Lee and Gerry T. Heydt

02-69

[\*\*Innovative Developments in Load as a Reliability Resource\*\*](#)

J. Eto, C. Goldman, G. Heffner, B. Kirby, J. Kueck, M. Kintner-Meyer, J. Dagle, T. Mount, W. Schulze, R. Thomas, R. Zimmerman

02-68

[Experimental Evidence about the Persistence of High Prices in a Soft-Cap Auction for Electricity](#)  
T. Mount, R. Thomas, C. Vossler, R. Zimmerman

02-67

[California Electricity Market Crisis: Causes, Remedies, and Prevention](#)  
C. Mensah-Bonsu, and S. Oren

02-65

[Comments on the FERC SMD NOPR](#)  
Shmuel Oren

02-64

[Economic Congestion Relief Across Multiple Regions Requires Tradable Physical Flow-Gate Rights](#)

Shmuel S. Oren and Andrew M. Ross

02-57

[Is System Control Entirely by Price Feasible?](#)  
Fernando L. Alvarado

02-55

[Locational Pricing and Scheduling for an Integrated Energy-Reserve Market](#)  
Jie Chen, James S. Thorp, Robert J. Thomas, Timothy D. Mount

02-40

[Estimating the Actual Cost of Transmission System Congestion](#)  
Thomas J. Overbye

02-38

[Two-Settlement Systems for Electricity Markets](#)  
Rajnish Kamat and Shmuel S. Oren

02-37

[Designs for Ramp-Constrained Day-Ahead Auctions](#)  
Shmuel S. Oren and Andrew A. Ross

02-34

[Markets for Reliability and Financial Options in Electricity: Theory to Support the Practice](#)  
Tim Mount, William Schulze and Richard E. Schuler

02-27

[Equilibrium Analysis of Forward Markets for Electricity and Reserves](#)  
Afzal Saeed Siddiqui

02-16

[Supergames in Electricity Markets: Beyond the Nash Equilibrium Concept](#)  
Pedro Correia, Thomas J. Overbye, Ian Hiskens

02-07

[An Individual Welfare Maximization Algorithm for Electricity Markets](#)

James D. Weber, Thomas J. Overbye

02-06

[\(Dis\)Proving Market Power](#)

Rajesh Rajaraman and Fernando Alvarado

02-02

[Two-Settlement Systems for Electricity Markets: Zonal Aggregation under Network uncertainty and Market Power](#)

Rajnish Kamat and Shmuel S. Oren

01-51

[Aligning Public Policy with Electricity Markets](#)

R. Schuler

01-50

[Kirchhoff vs. Competitive Electricity Markets: A Few Examples](#)

C. Murillo-Sanchez, R. Zimmerman, R. Thomas

01-49

[State Estimation for the Detection of Market Parameters](#)

Fernando Alvarado

01-48

[The FGR vs. FTR debate: Facts and Misconceptions](#)

Shmuel S. Oren

01-44

[Testing The Effects Of Price Responsive Demand On Uniform Price And Soft-Cap Electricity Auctions](#)

R. J. Thomas, T. D. Mount, R. Zimmerman, W. D. Schulze, R. E. Schuler, L. D. Chapman

01-41

[Multi-settlement Systems for Electricity Markets: Zonal Aggregation under Network Uncertainty and Market Power](#)

Rajnish Kamat and Shmuel S. Oren

01-26

[Using Weather Derivatives to Improve the Efficiency of Forward Markets for Electricity](#)

Tim Mount

01-20

[Market Based Risk Mitigation](#)

Shmuel S. Oren

01-18

[Testing the Performance of Uniform Price and Discriminative Auctions](#)

T.D. Mount, W.D. Schultze, R.J. Thomas, R.D. Zimmerman

01-17

[An Engineering Approach to Monitoring Market Power in Restructured Markets for Electricity](#)

C.E. Murillo-Sanchez, S.M. Ede, T.D. Mount, R.J. Thomas, and R.D. Zimmerman

01-13

[Exotic Options for Interruptible Electricity Supply Contracts](#)

Rajnish Kamat and Shmuel S. Oren

01-12

[Rational Buyer Meets Rational Seller: Reserves Market Equilibria under Alternative Auction Designs](#)

Rajnish Kamat and Shmuel S. Oren

00-46

[Strategic Behavior in Spot Markets for Electricity when Load is Stochastic](#)

T. Mount

00-45

[Can Experimental Economics Help Guide Restructuring of Electric Power?](#)

W. Schulze, S. Ede, R. Zimmerman, J. Bernard, T. Mount, R. Thomas, R. Schuler

00-44

[An Analysis of Price Volatility in Different Spot Markets for Electricity in the U.S.A.](#)

T. Mount, Y. Ning, H-N. Oh

00-43

[An Economic Analysis of the Self Commitment of Thermal Units](#)

S. Ede, R. Zimmerman, T. Mount, R. Thomas, W. Schulze

00-42

[Experimental Tests of Deregulated Markets for Electric Power: Market Power and Self-Commitment](#)

S. Ede, R. Zimmerman, T. Mount, R. Thomas, W. Schulze

00-41

[Generation Supply Bidding in Perfectly Competitive Electricity Markets](#)

George Gross and David Finlay

00-33

[Capacity Payments and Supply Adequacy in Competitive Electricity Markets](#)

Shmuel S. Oren

00-26

[Experimental Tests Of Competitive Markets For Electric Power](#)

Simon Ede, Timothy Mount, William Schulze, Robert Thomas, and Ray Zimmerman

00-25

[The Effect of Loading on Reactive Market Power](#)

Antonio C. Zambroni de Souza, Fernando Alvarado and Mevludin Glavic

00-24

[Electricity and Ancillary Services Markets in New York State: Market Power in Theory and Practice](#)

Richard E. Schuler

00-23

[Unbundled Reactive Support Service: Key Characteristics and Dominant Cost Component](#)

George Gross, Shu Tao, Ettore Bompard and Gianfranco Chicco

00-14

[Design of Ancillary Service Markets](#)

Shmuel Oren

00-10

[Are Price Spikes Predictable, Reproducible and Avoidable?](#)

Prof. Timothy Mount, Cornell University

00-08

[Reactive Power Support Services in Electricity Markets](#)

Sauer, Overbye, Gross, Alvarado, Oren, and Momoh

00-02

[Stability Analysis of Interconnected Power Systems Coupled with Market Dynamics](#)

F.L. Alvarado , J. Meng, C.L. DeMarco, W.S. Mota

99-19

[A Uniform Price Auction with Locational Price Adjustments for Competitive Electricity Markets](#)

R. Ethier, R. Zimmerman, T. Mount, W. Schulze, R. Thomas

99-18

[A Web-Based Platform for Experimental Investigation of Electric Power Auctions](#)

R. Zimmerman, R. Thomas, D. Gan, C. Murillo-Sanchez

99-16

[Reactive Power Market Power](#)

F. Alvarado, T. Overbye and P. Sauer

99-14

[Assessment of Transmission Constraint Costs: Northeast U.S. Case Study](#)

Tom Overbye, Doug Hale, Tom Leckey, Jamie Weber

99-05

[Designing Cost Effective Demand Management Contracts using Game Theory](#)

Murat Fahrioglu and Fernando L. Alvarado

99-03

[Optimal Power Flow Formulation in Market of Retail Wheeling](#)

Taiyou Yong, Robert Lasseter

98-35

[The Dynamics of Market Power with Deregulated Electricity Generation Supplies](#)

R. Schuler

98-34

[The Stability of Power Market Systems](#)

Fernando Alvarado

98-33

[The Dynamics of Customers Switching Suppliers in Deregulated Power Markets](#)

Richard E. Schuler

98-31

[Estimating the Volatility of Spot Prices in Restructured Electricity Markets and the Implications for Option Values](#)

Robert Ethier and Timothy Mount

98-30

[Designing Cost Effective Demand Management Contracts using Game Theory](#)

Murat Fahrioglu and Fernando L. Alvarado

98-28

[Stochastic Models of Energy Commodity Prices and Their Applications: Mean-reversion with Jumps and Spikes](#)

Shijie Deng

98-27

[Managing Transmission Risk: The Theory of Spatial Hedging and Arbitrage](#)

Rajesh Rajaraman and Fernando L. Alvarado

98-25

[Analysis and Visualization of Market Power in Electric Power Systems](#)

Thomas Overbye, Jamie Weber, Kollin Patten

98-22

[Market Power and Price Volatility in Restructured Markets for Electricity](#)

Tim Mount

98-21

Analytic and Experimentally-Derived Estimates of Market Power in Deregulated Electricity Systems: Policy Implications for the Management and Institutional Evolution of the Industry  
Richard E. Schuler

98-20

**Short-Term Generation Asset Valuation**  
Chung Li Tseng and Graydon Bartz

98-19

**Energy Auctions and Market Power: An Experimental Examination**  
Ray D. Zimmerman, John C. Bernard, Robert J. Thomas and William Schulze

98-18

**Price-Based Adaptive Spinning Reserve Requirements in Power System Scheduling**  
Chung-Li Tseng; Shmuel S. Oren , Alva J. Svoboda ; Raymond B. Johnson

98-17

**Combining Financial Double Call Options with Real Options for Early Curtailment of Electricity Service**  
Shmuel S. Oren

98-16

**Priority Network Access Pricing for Electric Power**  
Shijie Deng and Shmuel Oren

98-15

**Capturing Non-Convexities in Multi-Unit Electricity Auctions**  
Wedad J. Elmaghhraby

98-14

**Multi-unit Auctions With Complementarities: Issues of Efficiency in Electricity Auctions**  
Wedad J. Elmaghhraby

98-13

**Exotic Electricity Options and the Valuation of Electricity Generation and Transmission Assets**  
Shijie Deng, Blake Johnson, Aram Sogomonian

98-12

**The Efficiency of Multi-Unit Electricity Auctions**  
Wedad J. Elmaghhrabi and Shmuel S. Oren

98-08

**Alternative Auction Institutions for Purchasing Electric Power: An Experimental Examination**  
John Bernard, Ray Zimmerman, William Schulze, Robert Thomas, Timothy Mount, Richard Schuler

98-07

[\*\*Market Power: A Dynamic Definition\*\*](#)

Fernando L. Alvarado

98-03

[\*\*Markets for Electric Power: Experimental Results for Alternative Auction Institutions\*\*](#)

John Bernard, Robert Ethier, Timothy Mount, William Schulze, Ray D. Zimmerman, Deqiang Gan, Carlos Murillo-Sánchez, Robert J. Thomas, Richard Schuler

97-23

[\*\*Power System Bidding Tournaments for a Deregulated Environment\*\*](#)

E. Sakk, R. Thomas, R. Zimmerman

97-17

[\*\*Inclusion of Price Dependent Load Models in the Optimal Power Flow\*\*](#)

J.D. Weber, T.J. Overbye, C.L. DeMarco

97-16

[\*\*A Simulation Based Approach to Pricing Reactive Power\*\*](#)

J.D. Weber, T.J. Overbye, P.W. Sauer, C.L. DeMarco

97-15

[\*\*The Efficiency of Multi-unit Electricity Auctions\*\*](#)

Wedad Elmaghhraby and Shmuel Oren

97-11

[\*\*An Internet-Based Platform for Testing Generation Scheduling Auctions\*\*](#)

Ray Zimmerman, Robert Thomas, Deqiang Gan, Carlos Murillo-Sánchez

97-01

[\*\*The dynamics of power system markets\*\*](#)

Fernando L. Alvarado

[\*\*Back to Table of Contents\*\*](#)

## **Systems Reports and Selected Publications**

### **Reports**

08-12

[Effective Power System Control Center Visualization](#)

Tom Overbye

08-06

[Optimal Allocation of Static and Dynamic VAR Resources](#)

Sakis Meliopoulos

08-04

[Risk of Cascading Outages](#)

Ian Dobson and Jim McCalley

08-01

[A Tool for On-line Stability Determination and Control for Coordinated Operations between Regional Entities Using PMUs](#)

Vijay Vittal, Gerald Heydt, A.P. Sakis Meliopoulos

07-17

[Uncertain Power Flows and Transmission Planning](#)

Gerry Heydt and Peter Sauer

07-16

[The Electric Power Industry and Climate Change: Power Systems Research Possibilities](#)

Tom Overbye, Project Leader

07-08

[Condition Indicator Analysis for the Enhancement of Power System State Estimators](#)

Mark Rice

07-01

[Reliability Assessment Incorporating Operational Considerations and Economic Aspects for Large Interconnected Grids](#)

George Gross

06-45

[Enhanced State Estimators](#)

Ali Abur

06-26

[Risk-Based Resource Allocation for Distribution System Maintenance](#)

Ward Jewell

06-23

[Performance Assessment of Advanced Digital Measurement and Protection Systems: Part I](#)  
George Karady

06-22

[Performance Assessment of Advanced Digital Measurement and Protection Systems: Part II](#)  
Mladen Kezunovic

06-04

[Automated Integration of Condition Monitoring with an Optimized Maintenance Scheduler for Circuit Breakers and Power Transformers](#)

Jim McCalley, project leader

06-02

[Security Enhancement through Direct Non-Disruptive Load Control: Part II](#)  
Vijay Vittal

06-01

[Security Enhancement through Direct Non-Disruptive Load Control: Part I](#)  
Ian Hiskens, Project Leader

05-65

[Visualization of Power Systems and Components](#)  
Thomas J. Overbye, Project Leader

05-64

[New System Control Methodologies: Adapting AGC and Other Generator Controls to the Restructured Environment](#)

Christopher L. DeMarco, Project Leader

05-63

[Effects of Voltage Sags on Loads in a Distribution System](#)  
George Karady, Project Leader

05-62

[New Implications of Power System Fault Current Limits](#)  
G.T. Heydt, Project Leader

05-61

[Detection, Prevention and Mitigation of Cascading Events: Part III](#)  
Vijay Vittal and Xiaoming Wang

05-60

[Detection, Prevention and Mitigation of Cascading Events: Part II](#)  
Vaithianathan “Mani” Venkatasubramanian and Jaime Quintero

05-59

[Detection, Prevention and Mitigation of Cascading Events: Part I](#)

Mladen Kezunovic, Hongbiao Song and Nan Zhang

05-58

[Optimal Placement of Phasor Measurement Units for State Estimation](#)

Ali Abur, project leader

05-36

[Estimation of Synchronous Generator Parameters from On-line Measurements](#)

Gerald T. Heydt, Project Leader

05-14

[Distribution System Electromagnetic Modeling and Design for Enhanced Power Quality](#)

Sakis Meliopoulos, Project Leader

05-13

[Comprehensive Power System Reliability Assessment](#)

Sakis Meliopoulos, Project Leader

05-04

[On-Line Transient Stability Assessment Scoping Study](#)

Vijay Vittal, Project Leader

05-02

[Phasor Measurement Unit Data in Power System State Estimation](#)

Mark Rice and Gerald T. Heydt

03-06

[Integrated Security Analysis](#)

Kevin Tomsovic

02-49

[Voltage Security Margin Assessment](#)

Garng M. Huang and Ali Abur

02-45

[Power System State Estimation and Optimal Measurement Placement for Distributed Multi-Utility Operation](#)

Ali Abur and Garng Huang

02-43

[Robust Control of Large Scale Power Systems](#)

Vijay Vittal (Project Leader)

02-36

[Visualization of Power Systems](#)

Thomas J. Overbye, Douglas A. Wiegmann and Robert J. Thomas

02-28

[Coordination of Transmission Line Transfer Capabilities](#)

Mani V. Venkatasubramanian

02-23

[Congestion Management in Restructured Power Systems Using an Optimal Power Flow Framework](#)

A.S. Nayak and M.A. Pai

01-34

[Electric Power Transfer Capability: Concepts, Applications, Sensitivity, Uncertainty](#)

Ian Dobson, Scott Greene, Rajesh Rajaraman, Chris DeMarco, Fernando Alvarado, Mevludin Glavic, Jianfeng Zhang, Ray Zimmerman

01-05

[Automated Operating Procedures for Transfer Limits](#)

Liqiang Chen, Kevin Tomsovic and Anjan Bose

01-02

[CPFLOW for Power Tracer and Voltage Monitoring](#)

Hsiao-Dong Chiang and Hua Li

01-01

[Computer Simulation of Cascading Disturbances in Electric Power Systems](#)

Hongye Wang and James S. Thorp

00-01

[Avoiding and Suppressing Oscillations](#)

Ian Dobson

## Selected Publications

06-37

[A Proposed Design for a Short-Term Resource Adequacy Program](#)

George Gross and Pablo A. Ruiz

06-31

[Switching-Induced Stable Limit Cycles](#)

Ian A. Hiskens and Patel Bhageerath Reddy

06-30

[Distributed Output Feedback MPC for Power System Control](#)

Ian A. Hiskens, Aswin N. Venkat, James B. Rawlings, and Stephen J. Wright

06-27

**Sensitivity, Approximation and Uncertainty in Power System Dynamic Simulation**  
Ian A. Hiskens and Jassim Alseddiqi

06-24

**Non-Collocated Voltage and Current Measurements Used to Obtain Power**  
Brian C. Mann and Jerry Heydt

06-20

**Accuracy Improvement Strategies for Problematic Power System Measurements and their Effect on State Estimation**

Brian C. Mann and Jerry Heydt

06-15

**Compatibility and Interoperability Evaluation for All-digital Protection System through Automatic Application Test**

Peichao Zhang, Levi Portillo and Mladen Kezunovic

06-12

**Identification of Network Parameter Errors**

Jun Zhu and Ali Abur

06-11

**Transient Based Relay Testing: A New Scope and Methodology**

Nan Zhang, Hongbiao Song, and Mladen Kezunovic

06-07

**Significance of Load Modelling in Power System Dynamics**

I.A. Hiskens

05-70

**Non-Collocated Power Measurements in a Power System State Estimator**

B. Mann, G. Heydt and G. Strickler

05-69

**Automated Monitoring Functions for Improved Power System Operation and Control**

Mladen Kezunovic and G. Latisko

05-62

**Preventing Future Blackouts by Means of Enhanced Electric Power Systems Control: From Complexity to Order**

Marija Ilíc, Eric Allen, Jeffrey J. Chapman, Charles A. King, Jeffrey H. Lang, and Eugene Litvinov

05-59

**Detection, Prevention and Mitigation of Cascading Events: Part I**

Mladen Kezunovic, Hongbiao Song and Nan Zhang

05-58

[Optimal Placement of Phasor Measurement Units for State Estimation](#)

Ali Abur, project leader

05-53

[Managing Relationships Between Electric Power Industry Restructuring and Grid Reliability](#)

Robert J. Thomas

05-52

[Strategies to Address the Problem of Exiting Expertise in the Electric Power Industry](#)

Dennis Ray and Bill Snyder

05-51

[Monitoring of Power System Topology in Real-Time](#)

Mladen Kezunovic

05-48

[Issues Associated with the Development of a Wide-Area Analysis and Visualization](#)

Environment

John P. Stovall, Brendan J. Kirby, Thomas J. Overbye, James S. Thorp, and Arun G. Phadke

05-47

[An Estimator of Propagation of Cascading Failure](#)

Ian Dobson, Kevin Wierzbicki, Ben Carreras, Vickie Lynch, David Newman

05-45

[Observed Hybrid Oscillations in an Electrical Distribution System](#)

Vaibhav Donde and Ian A. Hiskens

05-44

[Non-Uniqueness in Reverse Time of Hybrid System Trajectories](#)

Ian A. Hiskens

05-43

[Dynamic Performance Assessment: Grazing and Related Phenomena](#)

Vaibhav Donde and Ian Hiskens

05-42

[Power System Modeling for Inverse Problems](#)

Ian A. Hiskens

05-41

[Limit-Induced Stable Limit Cycles in Power Systems](#)

P.B. Reddy and I.A. Hiskens

05-39

[Shooting Methods for Locating Grazing Phenomena in Hybrid Systems](#)

Vaibhav Donde and Ian A. Hiskens

05-38

**Differences in Capacity Requirements, Line Flows and System Operability under Alternative Deregulated Market Structures: Simulations Derived from Experimental Trials**

Nodir Adilov, Thomas Light, Richard Schuler, William Schulze, David Toomey and Ray Zimmerman

05-35

**Fault Current Issues for Market Driven Power Systems with Distributed Generation**

Natthaphob Nimpitiwan and Gerald T. Heydt

05-33

**Criticality in a Cascading Failure Blackout Model**

Dusko Nedic, Ian Dobson, Daniel Kirschen, Ben Carreras, and Vickie Lynch

05-32

**Implementing an Advanced Simulation Tool for Comprehensive Fault Analysis**

Nan Zhang and Mladen Kezunovic

05-30

**Static Security Analysis based on Vulnerability Index (VI) and Network Contribution Factor (NCF) Method**

Hongbiao Song and Mladen Kezunovic

05-25

**Requirements Specification for and Evaluation of an Automated Substation Monitoring System**

Mladen Kezunovic and G. Latisko

05-24

**Quantification of Corona Discharges on Nonceramic Insulators**

B. Pinnangudi, R. S. Gorur, and A. J. Kroese

05-23

**Predicting Contamination Flashover of Insulators: Successes and Shortcomings of Tests and Simulations**

Ravi S. Gorur and S. Venkataraman

05-22

**Insulators for Cold Urban Areas: The Problem of Road Salt**

Ravi Gorur and Sreeram Venkataraman

05-20

**Optimal Placement and Utilization of Phasor Measurements for State Estimation**

Xu Bei, Yeo Jun Yoon and Ali Abur

05-19

**Model Reduction in Power Systems Using Krylov Subspace Methods**

Dimitrios Chaniotis and M. A. Pai

05-18

**Improving Real-time Fault Analysis and Validating Relay Operations to Prevent or Mitigate Cascading Blackouts**

Nan Zhang, Mladen Kezunovic

05-17

**Static Analysis of Vulnerability and Security Margin of the Power System**

Hongbiao Song and Mladen Kezunovic

05-16

**Coordinating Fuzzy ART Neural Networks to Improve Transmission Line Fault Detection and Classification**

Nan Zhang and Mladen Kezunovic

05-15

**A Study of Synchronized Sampling Based Fault Location Algorithm Performance under Power Swing and Out-of-step Conditions**

Nan Zhang, Mladen Kezunovic

05-13

**Comprehensive Power System Reliability Assessment**

Sakis Meliopoulos, Project Leader

05-06

**A Criticality Approach to Monitoring Cascading Failure Risk and Failure Propagation in Transmission Systems**

Ian Dobson, Ben Carreras, and David Newman

05-04

**On-Line Transient Stability Assessment Scoping Study**

Vijay Vittal, Project Leader

05-02

**Phasor Measurement Unit Data in Power System State Estimation**

Mark Rice and Gerald T. Heydt

05-01

**Reducing the Risk of Major Blackouts Through Improved Power System Visualization**

Thomas J. Overbye, Douglas A. Wiegmann

04-60

**A Virtual Environment for Protective Relaying Evaluation and Testing**

A.P. Sakis Meliopoulos and George J. Cokkinides

04-53

**Float Together/ Sink Together? (The Effect of Connectivity on Power Systems)**

Richard E. Schuler

04-51

**Dynamic Embedded Optimization and Shooting Methods for Power System Performance Assessment**

I.A. Hiskens, J-W. Park and V. Donde

04-50

**Verifying the Protection System Operation Using an Advanced Fault Analysis Tool Combined with the Event Tree Analysis**

Nan Zhang and Mladen Kezunovic

04-49

**Stability Control using PEBS method and Analytical Sensitivity of the Transient Energy Margin**  
Hongbiao Song, Mladen Kezunovic

04-48

**Relieving Overload and Improving Voltage by the Network Contribution Factor (NCF) Method**  
Hongbiao Song, Mladen Kezunovic

04-47

**A Comprehensive Contribution Factor Method for Congestion Management**  
Hongbiao Song, Mladen Kezunovic

04-46

**Observability Analysis and Measurement Placement for Systems with PMUs**  
Bei Xu and Ali Abur

04-44

**Visualization and Animation of State Estimation Performance**  
A. P. Sakis Meliopoulos, George J. Cokkinides, Mike Ingram, Sandra Bell, and Sherica Mathews

04-41

**Static Collapse and Topological Cuts**  
Santiago Grijalva and Peter W. Sauer

04-39

**Joint Energy and Reserves Auction with Opportunity Cost Payment for Reserves**  
Shmuel Oren and Ramteen Sioshansi

04-37

**The Probability, Identification, and Prevention of Rare Events in Power Systems**  
Qiming Chen

04-32

**Complex Systems Analysis of Series of Blackouts: Cascading Failure, Criticality, and Self-organization**

Ian Dobson, Ben Carreras, Vickie Lynch, David Newman

04-31

**Branching Process Models for the Exponentially Increasing Portions of Cascading Failure Blackouts**

Ian Dobson, Ben Carreras, David Newman

04-30

**Planning of Reconfigurable Power Systems**

J. McCalley, R. Kumar, N. Elia, V. Ajjarapu, V. Vittal, H. Liu, L. Jin, O. Volij, W. Shang

04-29

**Electrical Blackouts: A Systemic Problem**

Jay Apt, Lester B. Lave, Sarosh Talukdar, M. Granger Morgan, and Marija Ilic

04-23

**Human Factors Aspects of Power System Flow Animation**

Doug Wiegmann, Gavin Essenberg, Tom Overbye, and Yan Sun

04-22

**Estimating Failure Propagation in Models of Cascading Blackouts**

Ian Dobson, Ben Carreras, Vickie Lynch, Bertrand Nkei, David Newman

04-13

**Three-Dimensional Displays as an Effective Visualization Technique for Power Systems Monitoring and Control**

Stephan Hoppe, Gavin Essenberg, Doug Wiegmann, and Tom Overbye

04-11

**Combined State Estimation and Measurement Calibration**

Shan Zhong and Ali Abur

04-10

**Innovative concepts for on-line synchronous generator parameter estimation**

Elias Kyriakides

04-09

**Auto Tuning of Measurement Weights in WLS State Estimation**

S. Zhong and Ali Abur

04-07

**Estimation of Synchronous Generator Parameters Using an Observer for Damper Currents and a Graphical User Interface**

Elias Kyriakides and G.T. Heydt

04-04

**Visualizations for Power System Contingency Analysis Data**

Yan Sun, Tom Overbye

04-03

[Probabilistic load-dependent cascading failure with limited component interactions](#)  
Ian Dobson, Ben Carreras, David Newman

04-02

[Modifying Eigenvalue Interactions Near Weak Resonance](#)  
Vincent Auvray, Ian Dobson, Louis Wehenkel

04-01

[A Loading-Dependent Model of Probabilistic Cascading Failure](#)  
Ian Dobson, Ben Carreras, David Newman

03-42

[Transient Testing of Protection Relays: Results, Methodology, and Tools](#)  
M. Kezunovic, T. Popovic, D. Sevcik, H. DoCarmo

03-41

[User Friendly, Open System Software for Teaching Protective Relaying Application and Design Concepts](#)  
Mladen Kezunovic

03-35

[The 2003 Blackout: Did the System Operator have Enough Power?](#)  
F. L. Alvarado and R. Rajaraman

03-32

[Trajectory Sensitivity Theory in Non Linear Dynamical Systems: Some Power System Applications](#)  
M. A. Pai and T. B. Nguyen

03-31

[Dynamic Security-Constrained Rescheduling of Power Systems Using Trajectory Sensitivities](#)  
Tony B. Nguyen and M. A. Pai

03-30

[Scaling of normal form analysis coefficients under coordinate change](#)  
Ian Dobson, Emilio Barocio

03-29

[Perturbations of Weakly Resonant Power System Electromechanical Modes](#)  
Ian Dobson, Emilio Barocio

03-28

[Collaboration to Facilitate Research and Education in a Transitioning Electric Power Industry](#)  
Dennis Ray and Frank Wayno

03-27

[An Essential Industry at the Crossroads: Deregulation, Restructuring, and a New Model for the United States' Bulk Power System](#)

Jeffrey Hein

03-23

[New Solutions for Substation Sensing, Signal Processing and Decision Making](#)

Mladen Kezunovic and Henry Taylor

03-20

[A branching process approximation to cascading load-dependent system failure](#)

Ian Dobson, Ben Carreras, David Newman

03-15

[Embedding Remote Experimentation In Power Engineering Education](#)

Mihaela M. Albu, Keith E. Holbert, Gerald T. Heydt, Sorin Dan Grigorescu and Vasile Trucă

03-14

[Design Of Delayed-Input Wide Area Power System Stabilizer Using Gain Scheduling Method](#)

Hongxia Wu and Gerry T. Heydt

03-12

[Quantum Computing in Power System Simulation](#)

Daniel J. Tylavsky and Gerry T. Heydt

03-11

[The Reliability Analysis of High Power Switches Composed of Series and Parallel Branches](#)

G.T. Heydt, et al

03-10

[Critical points and transitions in an electric power transmission model for cascading failure blackouts](#)

Ben Carreras, Vicki Lynch, Ian Dobson, David Newman

03-08

[Three Dimensional Visualization for Power System Contingency Analysis Voltage Data](#)

Yan Sun, Thomas J. Overbye

03-07

[Motion as an Effective Flow Visualization Technique for Power Systems Monitoring and Control](#)

G.R. Essenber, D.A. Wiegmann, T.J. Overbye, Y. Sun

03-04

[National Energy Supergrid Workshop Report](#)

Tom Overbye, Chauncey Starr, Paul Grant, Tom Schneider

03-01

**Feeding our Profession**

Gerald T. Heydt and Vijay Vittal

02-63

**Lp State Estimators for Power Systems**

N. Logic, E. Kyriakides and G. T. Heydt

02-62

**Consequence and Impact of Electric Utility Industry Restructuring on Transient Stability and Small Signal Stability Analysis**

Vijay Vittal

02-60

**Harmonic Limits for Single-Phase Equipment**

Ward Jewell and Dan Ward

02-59

**Single Phase Harmonic Limits**

Ward Jewell and Daniel J. Ward

02-53

**Bluenet II - A Detailed Realization of the Algorithm and Performance Analysis**

Zhifang Wang, Zygmunt J. Haas, Robert J. Thomas

02-52

**Data Integration and Information Exchange for Enhanced Control and Protection of Power Systems**

Mladen Kezunovic

02-51

**Animation and Visualization of Spot Prices via Quadratized Power Flow Analysis**

A.P. Sakis Meliopoulos, Sun Wook Kang, G. J. Cokkinides, and Roger Dougal

02-50

**Visualization for Shipboard Power Systems**

Karen L. Butler-Purry and N.D.R. Sarma

02-39

**Displaying Aggregate Data, Interrelated Quantities, and Data Trends in Electric Power Systems**

Ray Klump, Warren Wu, and Greg Dooley

02-36

**Visualization of Power Systems**

Thomas J. Overbye, Douglas A. Wiegmann and Robert J. Thomas

02-35

**Personnel Grounding and Safety Issues/Solutions Related to Servicing Optical Fiber Telecommunication Circuits in Optical Ground Wire (OPGW)**

Richard G. Olsen, Sakis Meliopoulos and George Karady

02-33

**A probabilistic loading-dependent model of cascading failure and possible implications for blackouts**

Ian Dobson, Ben Carreras, David Newman

02-32

**Blackout Mitigation Assessment in Power Transmission Systems**

Ben Carreras, Vicki Lynch, David Newman, Ian Dobson

02-30

**Incorporating Operational Characteristics and Startup Costs in Option-Based Valuation of Power Generation Capacity**

Shi-Jie Deng and Shmuel Oren

02-23

**Congestion Management in Restructured Power Systems Using an Optimal Power Flow Framework**

A.S. Nayak and M.A. Pai

02-21

**Advanced Substation Data Collecting and Processing for State Estimation Enhancement**

Sasa Jakovljevic and Mladen Kezunovic

02-20

**Agent-Oriented Approach to Work Order Management for Circuit Breaker Maintenance**

X. Xu, M.Kezunovic, and D. Wong

02-19

**Computation Of Critical Values Of Parameters In Power Systems Using Trajectory Sensitivities**

Tony B. Nguyen, M. A. Pai, and I. A. Hiskens

02-18

**Identification and Tracking of Parameters for a Large Synchronous Generator**

G. T. Heydt and Elias Kyriakides

02-15

**Incorporating TCSC into the Voltage Stability Constrained OPF Formulation**

Garng. M. Huang, Nirmal-Kumar C Nair

02-14

**Voltage Stability Constrained Load Curtailment Procedure to Evaluate Power System Reliability Measures**

Garng. M. Huang, Nirmal-Kumar C Nair

02-13

[\*\*Measurement Design of Data Exchange for Distributed Multi-Utility Operation\*\*](#)

Garng. M. Huang, Jiansheng Lei

02-12

[\*\*Detection of Dynamic Voltage Collapse\*\*](#)

Garng. M. Huang, Nirmal-Kumar C Nair

02-11

[\*\*Contribution Allocation for Voltage Stability In Deregulated Power Systems\*\*](#)

Garng. M. Huang, Kun Men

02-10

[\*\*A New Bifurcation Analysis for Power System Dynamic Voltage Stability Studies\*\*](#)

Garng M. Huang, Liang Zhao

02-09

[\*\*A Knowledge Based Data Exchange Design for Distributed Mega-RTO Operations\*\*](#)

Garng. M. Huang, Jiansheng Lei

02-08

[\*\*A Concurrent Non-Recursive Textured Algorithm for Distributed Multi-Utility State Estimation\*\*](#)

Garng. M. Huang, Jiansheng Lei

02-05

[\*\*An Advanced Visualization Platform for Real-Time Power System Operations\*\*](#)

Ray Klump, David Schooley, Thomas Overbye

02-04

[\*\*Symbolic Dynamic Models for Highly Varying Power System Loads\*\*](#)

Diwakar Tewari

02-03

[\*\*Human Factors Aspects of Power System Voltage Contour Visualizations\*\*](#)

Thomas J. Overbye, Douglas A. Wiegmann, Aaron M. Rich, Yan Sun

01-52

[\*\*Visualization and Animation of Protective Relay Operation from DFR Data\*\*](#)

A.P. Sakis Meliopoulos and George J. Cokkinides

01-47

[\*\*A Phase-Transition Model for Cascading Network Failure\*\*](#)

Chris DeMarco

01-45

[\*\*Visualization and Animation of Inverter-Driven Induction Motor Operation\*\*](#)

A. P. Sakis Meliopoulos, W. Gao, George J. Cokkinides

01-43

[Spectral Analysis of Energy-Constrained Reserves](#)

Fernando L. Alvarado

01-42

[Post-Contingency Equilibrium Analysis of Power Systems](#)

Peter W. Sauer

01-40

[Bluenet – a New Scatternet Formation Scheme](#)

Zhifang Wang, Robert J. Thomas, Zygmunt Haas

01-38

[Improving Circuit Breaker Maintenance Management Tasks by Applying Mobile Agent Software Technology](#)

M. Kezunovic, X. Xu and D. Wong

01-37

[Mobile Agent Software Applied in Maintenance Scheduling](#)

X. Xu and M. Kezunovic

01-36

[Electricity Supply Organization: Which End Is Up?](#)

Richard E. Schuler

01-35

[Effects of Non-transposed Lines and Unbalanced Loads on State Estimation](#)

Shan Zhong, Ali Abur

01-34

[Electric Power Transfer Capability: Concepts, Applications, Sensitivity, Uncertainty](#)

Ian Dobson, Scott Greene, Rajesh Rajaraman, Chris DeMarco, Fernando Alvarado, Mevludin Glavic, Jianfeng Zhang, Ray Zimmerman

01-33

[On Completion Times of Networks of Concurrent and Sequential Tasks](#)

Daniel Berleant, Lizhi Xie, Jianzhone Zhang and Gerry Sheble

01-32

[Measurement Design and State Estimation for Distributed Multi-Utility Operation](#)

Garng. M. Huang, Jiansheng Lei

01-31

[An OPF based Algorithm to Evaluate Load Curtailment Incorporating Voltage Stability Margin Criterion](#)

Garng. M. Huang, Nirmal-Kumar C Nair

01-30

[Mobile Agent Software Applied in Maintenance Scheduling](#)

M. Kezunovic, X. Xu

01-29

[A Spectral Bisection Partitioning Method for Electric Power Network Applications](#)

Supun Tiptipakorn

01-28

[Analysis and Design of Power Acceptability Curves for Industrial Loads](#)

John Kyei

01-27

[Human Factors Aspects of Power System Voltage Visualizations](#)

Doug Wiegmann, Aaron Rich, Tom Overbye, Yan Sun

01-25

[Power Systems Engineering Research Center](#)

Ward Jewell and Dennis Ray

01-23

[Examining criticality of blackouts in power system models with cascading events](#)

Ian Dobson, Jie Chen, Jim Thorp, Ben Carreras, David Newman

01-22

[Transfer Capability Calculator and Tutorial](#)

Ian Dobson, Scott Greene, Rajesh Rajaraman, Fernando Alvarado, Chris Demarco, Ray Zimmerman, Mevludin Glavic, Antonio DeSouza, Bob Thomas et al.

01-19

[Strong Resonance Effects in Normal Form Analysis and Subsynchronous Resonance](#)

Ian Dobson

01-15

[Storing Arb: Methods for Storage Valuation](#)

Hyungsok Ahn, Albina Danilova and Glen Swindle

01-11

[Transaction Based Power Flow Analysis For Transmission Utilization Allocation](#)

Garng Huang, H. Zhang

01-10

[TCSC as a Transient Voltage Stabilizing Controller](#)

Garng Huang, Tong Zhu

01-09

[Measurement Based Voltage Stability Monitoring of Power System](#)

Garng Huang, Liang Zhao

01-08

[\*\*Dynamic Voltage Stability Reserve Studies For Deregulated Environment\*\*](#)

Garng Huang, H. Zhang

01-07

[\*\*Communication Models for Third Party Load Frequency Control\*\*](#)

Sudipto Bhowmik, Kevin Tomsovic and Anjan Bose

01-05

[\*\*Automated Operating Procedures for Transfer Limits\*\*](#)

Liqiang Chen, Kevin Tomsovic and Anjan Bose

01-04

[\*\*Is Strong Modal Resonance a Precursor to Power System Oscillations?\*\*](#)

I. Dobson, J. Zhang, S. Greene, H. Engdahl, P.W. Sauer

01-02

[\*\*CPFLOW for Power Tracer and Voltage Monitoring\*\*](#)

Hsiao-Dong Chiang and Hua Li

01-01

[\*\*Computer Simulation of Cascading Disturbances in Electric Power Systems\*\*](#)

Hongye Wang and James S. Thorp

00-49

[\*\*Design Optimization and Performance Evaluation of the Relay Algorithms, Relays and Protective Systems Using Advanced Testing Tools\*\*](#)

M. Kezunovic and B. Kasztenny

00-48

[\*\*Parallel Processing Implementation of the Unit Commitment Problem with Full AC Power Flow Constraints\*\*](#)

C. Murillo-Sanchez, R. Thomas

00-47

[\*\*Stability-Constrained Optimal Power Flow\*\*](#)

D. Gan, R. Thomas, R. Zimmerman

00-40

[\*\*Increasing Student Interest and Comprehension in Power Engineering Education at the Graduate and Undergraduate Levels\*\*](#)

G. Karady, G. Heydt

00-38

[\*\*Neural Network Based Modeling of a Large Steam Turbine-Generator Rotor Body Parameters from On-Line Disturbance Data\*\*](#)

H. B. Karayaka, A. Keyhani, G. T. Heydt, B. Agrawal and D.Selin

00-36

**Development of Enhanced Electric Arc Furnace Models for Transient Analysis**

Gilsoo Jang, Weiguo Wang, G. T. Heydt, S. S. Venkata and Byongjun Lee

00-35

**Synchronous Machine Parameter Estimation Using Orthogonal Series Expansion**

J. Rico, G. T. Heydt, A. Keyhani, B. Agrawal and D. Selin

00-34

**Visualization of Oscillation Mode Shapes and Participation Factors**

Thomas J. Overbye, Craig M. Martini

00-32

**Impact of Renewable Distributed Generation on Power Systems**

M. Begovi , A. Pregelj, A. Rohatgi, and D. Novosel

00-31

**Stability of Limit Cycles in Hybrid Systems**

Ian A. Hiskens

00-30

**Extended Factors for Linear Contingency Analysis**

Peter W. Sauer, Karl E. Reinhard and Thomas J. Overbye

00-27

**Simulation Environment for Development and Testing of Plug Compatible Power System Applications**

Robin Podmore, Marck Robinson, and Anjan Bose

00-20

**Power System State Estimation: Modeling Error Effects and Impact on System Operation**

A. P. Sakis Meliopoulos, Bruce Fardanesh and Shalom Zelingher

00-19

**A Virtual Environment for Protective Relaying Evaluation and Testing**

A. P. Sakis Meliopoulos and George J. Cokkinides

00-18

**Human Factors Analysis of Power System Visualizations**

T.J Overbye, D.A. Wiegmann, A.M. Rich, Y. Sun

00-16

**Optimization and Visualization of the North American Eastern Interconnect Power Market**

Doug Hale and Tom Overbye

00-15

[\*\*Analysis of Electric Power System Disturbance Data\*\*](#)

Jie Chen, James S. Thorp and Manu Parashar

00-11

[\*\*Evidence for self-organized criticality in power system blackouts\*\*](#)

B.A. Carreras, D.E. Newman, I. Dobson, A.B. Poole

00-09

[\*\*Security Assessment: Decision Support Tools for Power System Operators\*\*](#)

Prof. James McCalley, Iowa State University

00-07

[\*\*Simulation of Bilateral Contracts in an AGC System after Restructuring\*\*](#)

V. Donde, M.A. Pai and I.A. Hiskens

00-06

[\*\*Enhancing Reliability of Power Protection Systems Economically in the Post-Restructuring Era\*\*](#)

J.S. Thorp and H. Wang

00-05

[\*\*New Methods for the Visualization of Electric Power System Information\*\*](#)

Tom Overbye & Jamie Weber

00-04

[\*\*Report of the Department of Energy's Power Outage Study Team\*\*](#)

DOE, National Labs and PSerc

00-03

[\*\*Is strong modal resonance a precursor to power system oscillations?\*\*](#)

Ian Dobson, Jianfeng Zhang, Scott Greene, Henrik Engdahl, Peter Sauer

00-01

[\*\*Oscillations Project Final Report\*\*](#)

Dobson, Alvarado, DeMarco, Sauer, Zhang, Greene, Engdahl

99-20

[\*\*Thermal Unit Commitment with Nonlinear Power Flow Constraints\*\*](#)

C. Murillo-Sanchez, R. Thomas

99-17

[\*\*Solving Power Flow Problems with a Matlab Implementation of the Power System Applications Data Dictionary\*\*](#)

Fernando L. Alvarado

99-13

[Initial evidence for self-organized criticality in electric power system blackouts](#)

Ben Carreras, David Newman, Ian Dobson, Bruce Poole

99-12

[Visualization of Power System Data](#)

Thomas J. Overbye, Jamie D. Weber

99-11

[Application of Optimal Multiplier Method In Weighted Least-Squares State Estimation Part II: Simulation](#)

Jianping Meng, Christopher L. DeMarco

99-10

[Application Of Optimal Multiplier Method In Weighted Least-Squares State Estimation Part I:Theory](#)

Jianping Meng, Christopher L. DeMarco

99-09

[Fast Determination of Simultaneous Available Transfer Capability \(ATC\)](#)

Ronghai Wang, Robert H. Lasseter, Jiangping Meng, Fernando L. Alvarado

99-07

[Detecting and Improving the Vulnerable Links in the Power Network: Part I](#)

Koeunyi Bae and James Thorp

99-06

[Using Utility Information to Calibrate Customer Demand Management Behavior Models](#)

Murat Fahrioglu and Fernando L. Alvarado

99-04

[Coordination of Excitation and Governing Control Based on Fuzzy Logic](#)

Taiyou Yong, Robert H. Lasseter, Wenjin Cui

99-02

[The Impact Of Generation Mix On Placement Of Static Var Compensators](#)

Robert H. Lasseter, Ronghai Wang

99-01

[A Virtual Environment for Interactive Visualization of Power System Economic and Security Information](#)

Thomas J Overbye, Raymond P. Klump, Jamie D. Weber

98-26

[Visualization of Flows and Transfer Capability in Electric Networks](#)

Thomas J. Overbye, James D. Weber, Mark Laufenberg

98-24

**Identifying Swing Mode Bifurcations & Associated Limits on Available Transfer Capability**  
C.L. DeMarco

98-11

**Margin and Sensitivity Methods for Security Analysis of Electric Power Systems**  
Scott Greene

98-10

**Is modal resonance a precursor to power systems oscillations?**  
Ian Dobson, Jianfeng Zhang, Scott Greene, Henrik Engdahl, Peter Sauer

98-09

**A Transient Stability Constrained Optimal Power Flow**  
Deqiang Gan, Robert J. Thomas, Ray D. Zimmerman

98-06

**The Design of Optimal Demand Management Programs**  
Murat Fahrioglu and Fernando L. Alvarado

98-04

**Voltage Collapse Margin Sensitivity Methods applied to the Power System of Southwest England**  
Scott Greene, Ian Dobson

98-02

**Real Time Control of Oscillations of Electric Power Systems**  
P. Sauer, M. Pai, S. Fernandes, I. Dobson, F. Alvarado, S. Greene, R. Thomas, H-D. Chiang

98-01

**MATPOWER: Users's Manual (Version 2.0)**  
Ray Zimmerman and Deqiang Gan

97-22

**Re-Dispatching Generation to Increase Power System Security Margin and Support Low Voltage Bus**  
Ronghai Wang & Robert H. Lasseter

97-21

**StatCom Controls for Operation with Unbalanced Voltages**  
Clark Hochgraf & Robert Lasseter

97-20

**The Impact of Generation Mix on Placement of Static Var Compensators**  
Robert H. Lasseter and Ronghai Wang

97-19

[Solving Unit Commitment by a Unit Decommitment Method](#)

Chung-Li Tseng, Chao-an Li, Shmuel Oren

97-18

[Underlying Technical Issues in Electricity Deregulation](#)

Robert J. Thomas and Thomas R. Schneider

97-13

[An Importance Sampling Application: 179 Bus WSCC System under Voltage Based Hidden Failures and Relay Misoperations](#)

Koeunyi Bae and James S. Thorp

97-12

[Thermal Unit Commitment Including Optimal AC Power Flow Constraints](#)

Carlos Murillo-Sanchez, Robert J. Thomas

97-10

[PowerWeb User's Manual](#)

Robert J. Thomas, Ray D. Zimmerman, Robert Ethier

97-08

[Contingency Ranking for Voltage Collapse via Sensitivities from a Single Nose Curve](#)

Scott Greene, Ian Dobson, Fernando L. Alvarado

97-07

[Sensitivity of the loading margin to voltage collapse with respect to arbitrary parameters](#)

Scott Greene, Ian Dobson, Fernando L. Alvarado

97-06

[MinISO: A Minimal Independent System Operator](#)

Pravin Varaiya and Felix Wu

97-05

[Unbundling Power Quality Services: Technical Issues](#)

Robert Lasseter, Clark Hochgraf

97-04

[Technical Challenges of Computing Available Transfer Capability \(ATC\) in Electric Power Systems](#)

Peter W. Sauer

97-03

[A Simulation Tool for Analysis of Alternative Paradigms for the New Electricity Business](#)

Thomas J. Overbye, Peter W. Sauer, George Gross, Mark J. Laufenberg, Jamie D. Weber

97-02

**Simulation of the Multi-Node Open Access Same-Time Information System**

Yong Tian, George Gross

**[Back to Table of Contents](#)**

## **T&D Technologies Reports and Selected Publications Reports**

08-15

[Massively Deployed Sensors](#)

Jerry Heydt

08-07

[Optimized Fault Location](#)

Mladen Kezunovic

08-05

[Transient Testing of Protective Relays: Study of Benefits and Methodology](#)

Mladen Kezunovic, Sakis Meliopoulos, Ward Jewell

08-03

[Digital Protection System Using Optical Instrument Transformers and Digital Relays](#)

Interconnected by an IEC 61850-9-2 Digital Process Bus

Mladen Kezunovic, George Karady, Levi Portillo, Zarko Djekic, Sadik Kucaksar, Yan Ma

08-02

[Satellite Imagery for the Identification of Interference with Overhead Power Lines](#)

George Karady, Gerald Heydt, Matthias Moeller, Yoshihiro Kobayashi

07-38

[Automated Circuit Breaker Monitoring](#)

Mladen Kezunovic, Project Leader

07-31

[Reliability Based Vegetation Management Through Intelligent System Monitoring](#)

B. Don Russell, Project Leader

06-42

[Prediction of Flashover Voltage of Insulators Using Low Voltage Surface Resistance Measurement](#)

Ravi Gorur

06-40

[A Novel Approach for Prioritizing Maintenance of Underground Cables](#)

Ravi Gorur

06-21

[Consequences of Fault Currents Contributed by Distributed Generation](#)

Natthaphob Nimpitiwan

06-03

[Control and Design of Microgrid Components](#)

Robert H. Lasseter, Project Leader

05-57

[Enhanced Reliability of Power System Operation Using Advanced Algorithms and IEDs \(Part II\): Detecting Circuit Breaker Status Errors in Substations](#)

Ali Abur

05-56

[Enhanced Reliability of Power System Operation Using Advanced Algorithms and IEDs: Part I](#)

Mladen Kezunovic, Project Leader

04-35

[The Evaluation of Stochastic Available Transfer Capability for Transmission Expansion](#)

Gerald T. Heydt and Jonathan W. Stahlhut

04-34

[Consequences of Fault Currents Contributed by Distributed Generation](#)

N. Nimpitiwan and G.T. Heydt

04-32

[Evaluation of Critical Components of Nonceramic Insulators \(NCI\) In-Service: Role of Defective Interfaces](#)

Ravi Gorur

04-27

[Optical Sensor for Transformer Monitoring](#)

Rahmat Shoureshi (Project Leader)

04-26

[Intelligent Transformer Monitoring System Utilizing Neuro-Fuzzy Technique Approach](#)

Rahmat Shoureshi (Project Leader)

04-25

[Evaluation of Distributed Electric Energy Storage and Generation](#)

Ward Jewell (Project Leader)

03-26

[Risk-Based Maintenance Allocation and Scheduling for Bulk Transmission System Equipment](#)

Jim McCalley (Project Leader)

02-48

[Enhanced State Estimation by Advanced Substation Monitoring](#)

Ali Abur (Project Leader)

02-47

**Mobile Agent Applications for Power Apparatus Monitoring and Maintenance**  
Mladen Kezunovic

02-46

**Wireless Communications in Substations**  
Mladen Kezunovic

02-44

**Accurate Fault Location in Transmission Networks Using Modeling, Simulation and Limited Field Recorded Data**

Mladen Kezunovic (Project Leader)

02-35

**Personnel Grounding and Safety Issues/Solutions Related to Servicing Optical Fiber Telecommunication Circuits in Optical Ground Wire (OPGW)**

Richard G. Olsen, Sakis Meliopoulos and George Karady

02-31

**Differential GPS Measurement of Overhead Conductor Sag: Software Implementation**  
G. T. Heydt and Robert Olsen

02-28

**Analysis and Design of Power Acceptability Curves for Industrial Loads**  
John Kyei

02-26

**Investigation of Fuel Cell System Performance and Operation: A Fuel Cell as a Practical Distributed Generator**

George Karady, Priyantha Sirisooriya and Richard G. Farmer

02-25

**Condition Monitoring and Maintenance Strategies for In-Service Nonceramic Insulators (NCI), Underground Cables and Transformers**

Ravi Gorur

02-24

**Development of a Graphic User Interface for an Overhead Conductor Sag Instrument**  
G. T. Heydt

02-18

**Identification and Tracking of Parameters for a Large Synchronous Generator**  
G. T. Heydt and Elias Kyriakides

02-17

**Assessing Deterioration of ADSS Fiber Optic Cables Due to Corona Discharge**  
George G. Karady and Johnny Madrid

01-21

[Simulation of Top-Oil Temperature for Transformers](#)

Yong Liang

01-16

[Electric Transmission Line Flashover Prediction System](#)

Felix Amarch

## T&D - Selected Publications

06-39

[Generalized Line Outage Distribution Factors](#)

Teoman Guler, George Gross and Minghai Liu

06-38

[Detection of Island Formation and Identification of Causal Factors under Multiple Line Outages](#)

Teoman Guler and George Gross

06-35

[Multi-Area Generation Adequacy Planning Using Stochastic Programming](#)

Chanan Singh and Panida Jirutitijaroen

06-34

[A Hybrid Method for Multi-Area Generation Expansion using Tabu- search and Dynamic Programming](#)

Chanan Singh and Panida Jirutitijaroen

06-33

[A Global Decomposition Algorithm for Reliability Constrained Generation Planning and Placement](#)

Chanan Singh and Panida Jirutitijaroen

06-32

[Reliability and Cost trade-off in Multi-Area Power System Generation Expansion Using Dynamic Programming and Global Decomposition](#)

Chanan Singh and Panida Jirutitijaroen

06-29

[Distributed MPC Strategies for Automatic Generation Control](#)

Ian A. Hiskens, Aswin N. Venkat, James B. Rawlings, and Stephen J. Wright

06-25

[Complete Fault Analysis for Long Transmission Line Using Synchronized Sampling](#)

Nan Zhang, Mladen Kezunovic

06-18

[Statistical Estimation of Cascading Blackout Size and Propagation with Branching Processes](#)  
Kevin Wierzbicki

06-17

[An Approach to Statistical Estimation of Cascading Failure Propagation in Blackouts](#)  
Kevin Wierzbicki and Ian Dobson

06-16

[Human Factors Aspects of Three-Dimensional Visualization of Power System Information](#)  
Douglas A. Wiegmann, Thomas J. Overbye, Stephan M. Hoppe, Gavin R. Essenberger and Yan Sun

06-14

[Prediction of Flashover Voltage of Non-ceramic Insulators Under Contaminated Conditions](#)  
S. Venkataraman and R. S. Gorur

06-08

[Autonomous Control of Microgrids](#)  
Paolo Piagi and Robert H. Lasseter

06-06

[Load as a Controllable Resource for Dynamic Security Enhancement](#)  
I.A. Hiskens

05-68

[Conflicting Investment Incentives in Electricity Transmission](#)  
Enzo Sauma and Shmuel S. Oren

05-57

[Enhanced Reliability of Power System Operation Using Advanced Algorithms and IEDS \(Part II\): Detecting Circuit Breaker Status Errors in Substations](#)  
Ali Abur

05-56

[Enhanced Reliability of Power System Operation Using Advanced Algorithms and IEDs: Part I](#)  
Mladen Kezunovic, project leader

05-49

[Condition Data Aggregation with Application to Failure Rate Calculation of Power Transformers](#)  
Jyotishman Pathak, Yong Jiang, Vasant Honavar, and James McCalley

05-34

[Fault Current Calculation by The Least Squares Method](#)  
Natthaphob Nimpitiwan and Gerald T. Heydt

05-31

[\*\*A Novel Digital Relay Model Based on SIMULINK and Its Validation Based on Expert System\*\*](#)  
Xu Luo and Mladen Kezunovic

05-29

[\*\*Interactive Protection System Simulation Using ATP MODELS and C++\*\*](#)  
Xu Luo and Mladen Kezunovic

05-28

[\*\*Fault Analysis Based on Integration of Digital Relay and DFR Data\*\*](#)  
Xu Luo and Mladen Kezunovic

05-27

[\*\*Automated Analysis of Protective Relay Data\*\*](#)  
Mladen Kezunovic, Xu Luo

05-26

[\*\*Automated Analysis of Digital Relay Data Based on Expert System\*\*](#)  
Xu Luo and Mladen Kezunovic

05-21

[\*\*Automatic Simulation Of IED Measurements For Substation Data Integration Studies\*\*](#)  
Yang Wu and Mladen Kezunovic

05-14

[\*\*Distribution System Electromagnetic Modeling and Design for Enhanced Power Quality\*\*](#)  
Sakis Meliopoulos, Project Leader

05-12

[\*\*CERTS Proves that Two Grids are Better than One\*\*](#)  
David Engle

05-10

[\*\*Pricing and Hedging Electricity Supply Contracts: a Case with Tolling Agreements\*\*](#)  
Shi-Jie Deng and Zhendong Xia

05-09

[\*\*The Inherent Inefficiency of Simultaneously Feasible Financial Transmission Rights Auctions\*\*](#)  
Shi-Jie Deng, Shmuel Oren, and Sakis Meliopoulos

05-07

[\*\*The Impact of Various Upgrade Strategies on the Long-Term Dynamics and Robustness of the Transmission Grid\*\*](#)  
David Newman, Ben Carreras, Vickie Lynch, and Ian Dobson

05-03

[\*\*Technical Considerations for Broadband Powerline \(BPL\) Communication\*\*](#)  
Robert Olsen

04-43

[Automated Monitoring and Control Using New Data Integration Paradigm](#)

Mladen Kezunovic, Tanja Djokic, and Tatjana Kostic

04-28

[Analysis of Angle Stability Problems: A Transmission Protection Systems Perspective](#)

S. A. Soman, T. B. Nguyen, M. A. Pai, and R. Vaidyanathan

04-20

[The Inherent Inefficiency of Simultaneously Feasible Financial Transmission Rights Auctions](#)

Shijie Deng, Shmuel Oren and Sakis Meliopoulos

04-16

[Comparative Analysis of Congestion Management Schemes under a Unified Framework](#)

Ettore Bompard, Pedro Correia, George Gross, and Mikael Amelin

04-12

[Voltage Stability Enhancement via Model Predictive Control of Load](#)

Ian Hiskens and B. Gong

04-08

[Fault Current Issues for Market Driven Power Systems with Distributed Generation](#)

N. Nimpitiwan, G. Heydt

04-05

[Microgrid: A Conceptual Solution](#)

R. H. Lasseter & Paolo Piagi

03-37

[Transmission Congestion-Management Schemes: A Comparative Analysis Under a Unified Framework](#)

E. Bompard, P. Correia, G. Gross and M. Amelin

03-24

[Dynamical and probabilistic approaches to the study of blackout vulnerability of the power transmission grid](#)

Ben Carreras, Vicki Lynch, Ian Dobson, David Newman

03-19

[Cascading Failures: Survival vs. Prevention](#)

Sarosh N. Talukdar, Jay Apt, Marija Ilic, Lester B. Lave, and M. Granger Morgan

03-18

[A Comparison of the AC and DC Power Flow Models for LMP Calculations](#)

Thomas J. Overbye, Xu Cheng and Yan Sun

03-17

[Complex Dynamics of Blackouts in Power Transmission Systems](#)

Ben Carreras, Vicki Lynch, Ian Dobson, David Newman

03-13

[The Propagation of Disturbances in Power Distribution Systems](#)

N. Nimpitiwan, et al

03-09

[Cascading dynamics and mitigation assessment in power system disturbances via a hidden failure model](#)

Jie Chen, James Thorp, Ian Dobson

03-03

[Fuel Parameter and Quality Constraints for Microturbine Distributed Generators](#)

Phanikrishna Gomatom and Ward Jewell

03-02

[Fuel Parameter and Quality Constraints for Fuel Cell Distributed Generators](#)

Phanikrishna Gomatom and Ward Jewell

02-66

[Effectiveness of the Distribution Factor Approximations Used in Congestion Modeling](#)

Minghai Liu and George Gross

02-61

[Risk-based Maintenance Allocation and Scheduling for Bulk Electric Power Transmission System Equipment](#)

Yong Jiang, Ming Ni, James D. McCalley and Tim Van Voorhis

02-58

[Feasibility Evaluation of Distributed Energy Generation and Storage for Cost and Reliability Using the ‘Worth-Factor’ Criterion](#)

Phanikrishna Gomatom and Ward Jewell

02-56

[A MultiPhase Power Flow Model for  \$\mu\$ Grid Analysis](#)

A. P. Sakis Meliopoulos, George J. Cokkinides, Robert Lasseter

02-54

[Identifying Transformer Incipient Events for Maintaining Distribution System Reliability](#)

Karen L. Butler-Purry, Mustafa Bagriyanik

02-29

[An Initial Complex Systems Analysis of the Risks of Blackouts in Power Transmission Systems](#)

Ian Dobson, David Newman, Ben Carreras, Vickie Lynch

02-28

**Coordination of Transmission Line Transfer Capabilities**

Mani V. Venkatasubramanian

02-26

**Investigation of Fuel Cell System Performance and Operation: A Fuel Cell as a Practical Distributed Generator**

George Karady, Priyantha Sirisooriya and Richard G. Farmer

02-25

**Condition Monitoring of In-Service Nonceramic Insulators and Underground Cables**

R. S. Gorur

02-24

**Development of a Graphic User Interface for an Overhead Conductor Sag Instrument**

G. T. Heydt

02-22

**A Novel Method for Transmission Network Fault Location Using Genetic Algorithms and Sparse Field Recordings**

Mladen Kezunovic, Shanshan Luo, and Donald R. Sevcik

02-17

**Assessing Deterioration of ADSS Fiber Optic Cables Due to Corona Discharge**

George G. Karady and Johnny Madrid

02-01

**Quantifying Transmission Reliability Margin**

Jianfeng Zhang, Ian Dobson, Fernando Alvarado

01-46

**Real Time Digital Processing of GPS Measurements for Transmission Engineering**

C. Mensah-Bonsu and G. T. Heydt

01-39

**Integrating Distributed Generation Technology into Demand Management Schemes**

M.Fahrioglu, T.Yong, R.Lasseter & F.Alvarado

01-24

**Dynamics, criticality and self-organization in a model for blackouts in power transmission systems**

Ben Carreras, Vickie Lynch, Ian Dobson, David Newman

01-21

**Simulation of Top-Oil Temperature for Transformers**

Yong Liang

01-16

[Electric Transmission Line Flashover Prediction System](#)

Felix Amarh

01-14

[Prospects for Dynamic Transmission Circuit Ratings](#)

K. E. Holbert and G. T. Heydt

01-06

[Adaptive Power Flow Method for Distribution Systems with Dispersed Generation](#)

Yaming Zhu and Kevin Tomsovic

00-39

[Instrumentation and Measurement of Overhead Conductor Sag Using the Differential Global Positioning Satellite System](#)

Chris Mensah-Bonsu

00-37

[Application of the Global Positioning System to the Measurement of Overhead Power Transmission Conductor Sag](#)

C. Mensah-Bonsu, U. Fernández, G. T. Heydt, Y. Hoverson, J. Schilleci and B. Agrawal

00-29

[Network Control as a Distributed, Dynamic Game](#)

Sarosh Talukdar and Eduardo Camponogara

00-28

[Min-max Transfer Capability: A New Concept](#)

D. Gan, X. Luo, D. V. Bourcier, and R. J. Thomas

00-22

[Utility Application of Fiber Optic Cables](#)

George Karady

00-21

[Instrumentation And Measurement Of Overhead Conductor Sag Using The Differential Global Positioning Satellite System](#)

Chris Mensah-Bonsu

00-17

[Efficient Available Transfer Capability Analysis Using Linear Methods](#)

Jamie Weber

00-13

[Modeling blackout dynamics in power transmission networks with simple structure](#)

B.A. Carreras, V.E. Lynch, M.L. Sachtjen, I. Dobson, D.E. Newman

00-12

[An initial model for complex dynamics in electric power system blackouts](#)

I. Dobson, B.A. Carreras, V.E. Lynch, D.E. Newman

99-15

[Sensitivity of transfer capability margins with a fast formula](#)

Scott Greene, Ian Dobson, Fernando Alvarado

99-08

[Suggested Analytic Approach to Transmission Reliability Margin; Draft Report June 1999](#)

Jianfeng Zhang, Ian Dobson, Fernando L. Alvarado

98-36

[Thermal Unit Commitment Including Optimal AC Power Flow](#)

C. Murillo-Sanchez, R. Thomas

98-23

[Control of Distributed Resources](#)

Robert H. Lasseter

98-05

[Alternatives for Calculating Transmission Reliability Margin \(TRM\) in Available Transfer Capability \(ATC\)](#)

Peter W. Sauer

97-14

[A Transmission-Constrained Unit Commitment Method](#)

Chung-Li Tseng, Shmuel S. Oren, Carol S. Cheng, Chao-an Li, Alva J. Svoboda, Raymond B. Johnson

97-09

[Initial Concepts for Applying Sensitivity to Transfer Capability](#)

Scott Greene, Ian Dobson, Fernando L. Alvarado, Peter W. Sauer

[Back to Table of Contents](#)

## Tools and Additional Resources

**PowerWeb** is an Internet-based simulation used for experimentally testing power market auction designs. It is publicly available through the [PSERC web site](#) or by going to <http://www.pserc.cornell.edu/powerweb>.

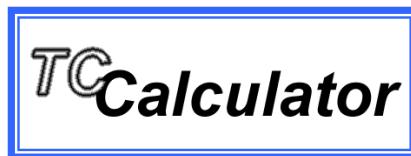
The screenshot shows the 'Netscape: PowerWeb: Auction Results' window. At the top, there are menu icons and a toolbar. The main header reads 'POWER WEB'. On the right, it says 'Name: Select... [test] Test User Logout', 'Session: Select... [758] Example Session', 'Representing: Select...', and 'Period 1'. Below the header, there are two sections: 'Auction Results for Generator 1' and 'Auction History (Periods 1 - 1)'. The 'Auction Results' section contains a table titled 'Generator 1: Results for Period 1 (duration = 1.0 hour)'. The table has columns for Block, Capacity (MW), Marginal Cost (\$/MW), Offer Price (\$/MW), Quantity Sold (MW), Selling Price (\$/MWh), Revenue (\$), Standby Recall Cost (\$), Variable Cost (\$), and Earnings (\$). The 'Auction History' section contains a table titled 'Generator 1: History' with columns for Period, Actual System Load (MW), Qty Sold (MW), Market Share, Offer Price (\$/MWh), Selling Price (\$/MWh), Avg Market Price (\$/MWh), and Earnings (\$). Both tables include summary rows for 'Total' and '1 - 1'.

Block	Capacity (MW)	Marginal Cost (\$/MW)	Offer Price (\$/MW)	Quantity Sold (MW)	Selling Price (\$/MWh)	Revenue (\$)	Standby Recall Cost (\$)	Variable Cost (\$)	Earnings (\$)
1	50.0	\$20.00	\$20.00	50.0	\$52.00	\$2600.00	\$250.00	\$1000.00	\$1350.00
2	20.0	\$40.00	\$40.00	20.0	\$52.00	\$1040.00	\$100.00	\$800.00	\$140.00
3	10.0	\$48.00	\$60.00	-	-	-	\$50.00	-	-\$50.00
4	10.0	\$50.00	\$80.00	-	-	-	\$50.00	-	-\$50.00
5	10.0	\$52.00	-	-	-	-	-	-	-
Total	100.0			70.0	\$52.00	\$3640.00	\$450.00	\$1800.00	\$1390.00
							— Interest Charge	\$1200.00	
							= Total Earnings	\$190.00	

Period	Actual System Load (MW)	Qty Sold (MW)	Market Share	Offer Price (\$/MWh)				Selling Price (\$/MWh)	Avg Market Price (\$/MWh)	Earnings (\$)	
				Block 1	Block 2	Block 3	Block 4				
1	547.0	70.0	12.8%	\$20.00	\$40.00	\$60.00	\$80.00	-	\$52.00	\$52.00	\$190.00
1 - 1									Cumulative Earnings:	Cumulative Earnings * Exchange Rate (0.0002):	\$190.00

Advances in calculating transfer capability are incorporated in TC Calculator, a tutorial and calculator available through the [PSERC web site](#) or by going to <http://www.pserc.cornell.edu/tcc/>.



**MATLAB Power System Simulation Package (MATPOWER)** is a package of Matlab m-files for solving power flow and optimal power flow problems. It is intended as a simulation tool for researchers and educators which will be easy to use and modify. MATPOWER is designed to give the best performance possible while keeping the code simple to understand and modify. To access MATPOWER, go to the [PSERC web site](#) or directly to <http://www.pserc.cornell.edu/matpower/>.

## **Digital Proceedings from the Hawaiian International Conference on System Sciences**

For a number of years, PSERC faculty have organized sessions on timely research topics for the electric power industry. Papers can be obtained from the HICSS digital library by clicking on the year of interest: [2007](#), [2006](#), [2005](#), [2004](#), [2003](#), [2002](#), [2001](#), [2000](#), [1999](#).

[\*\*Back to Table of Contents\*\*](#)