

Register by January 21 and SAVE!



Connecting Electric Professionals with Powerful Ideas

electric west 2011

www.electricshow.com

Long Beach Convention Center – Hall B • Long Beach, CA

Professional Advancement Courses: February 22

Conference: February 22-24 • Exhibit Hall: February 23-24



Keynote Presentation:

*Electrical Safety Roadmap
Where We've Been,
Where We're Going,
Where We Need to Be*

Mary Capelli-Schellpfeffer, MD, MPA
Principal, CapSchell, Inc. and Medical Director,
Loyola Occupational Health Service



Lunch n' Learn:

*Plug-In Electric
Vehicles:
Getting PEV-Ready*

Dick Cromie, Program Manager -
Advanced Technology, Southern California
Edison Company

Attendee Brochure



Sponsored by:

EC&M Electrical Wholesaling

INTELLIGENT ENERGY PORTAL

Produced by:

 **PENTON**

Welcome



Long Beach Convention Center – Hall B
Long Beach, CA
Professional Advancement Courses: February 22
Conference: February 22-24
Exhibit Hall: February 23-24

2011 is a particularly important year for those who need to stay current on the National Code changes and Electric West offers a variety of code change workshops and courses to help you address them.

For 23 years, Electric West has been the source for finding energy solutions. Traditionally an event serving contracting professionals, Electric West has expanded to include critical information and products for electrical engineers and consultants who oversee the design and development of electrical products, software and services, and plant and facility managers. Electric West remains the largest marketplace in the western U.S. for electrical design engineers, consultants, electrical maintenance professionals and installers to gather and learn the latest trends, technologies and issues the industry is facing.

Last year we worked to enhance the event and boasted over 40% new speakers, over 60% brand new program content and maintained steady attendance despite a down economy.

We're excited to bring you what you need to be prepared for tomorrow. Be sure to check out details on the following inside:

- An exhibit hall featuring leading suppliers showcasing the latest products and services – page 3
- **FREE** Keynote Presentation – an overview of the Electrical Safety Roadmap – page 4
- **FREE** Ask the Experts Session – Get your questions answered – page 4
- **NEW** Lunch n' Learn Program – What you need to know about Plug-In Electric Vehicles – page 5
- Workshops and sessions covering NEC Code requirements and other pertinent topics you want – pages 10-17

We'd like to officially thank our newly formed Advisory Committee. The Advisory Committee is comprised of your industry peers, attendees, exhibitors, speakers and leaders in the electrical industry. With their input and guidance Electric West will continue to develop exhibiting opportunities and must-have education content to further your professional development.

We are looking forward to building the momentum from 2010. Electric West is your event. Now, more than ever, is the time to come together and support the industry.

For the latest show information and to register, please visit www.electricshow.com.

Be sure to Register by January 21, 2011 to Save!

We look forward to seeing you in Long Beach!



A handwritten signature in black ink that reads "Florence Torres".

Florence Torres
Conference Director & Show Manager
Electric West



A handwritten signature in black ink that reads "Michael Eby".

Mike Eby
Editor-in-Chief
EC&M Magazine

Exhibit Hall

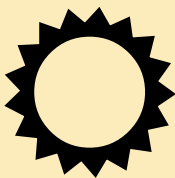
The Electric West Exhibit Hall is your best place to learn about the latest products the electrical design and maintenance industry has to offer:

- Boxes & Enclosures
- Building Automation Systems
- Business Equipment & Services
- Conduit, Raceway & Wireways
- Connectors & Terminating Devices
- Construction Equipment
- Consulting Services
- Datacom & Fiber Optic Equipment & Systems
- Electric Vehicle Charging Stations
- Facility Management Systems
- Fasteners, Hangers & Accessories
- Fittings, Conduit & Cable
- Home Automation Systems
- Industry Associations / Publishing Companies
- Instrumentation & Monitoring Equipment
- Lighting & Lighting Controls
- Motors & Motor Controls
- Power Distribution Equipment
- Power Quality Equipment
- Power Sources
- Protective Devices
- Safety Equipment & Apparel
- Security Equipment & Systems
- Software
- Solar Energy Equipment & Systems
- Specialty Products & Services
- Suppliers / Distributors
- Test Equipment
- Tools
- Training Services
- Transformers
- Vehicles & Vehicle Equipment
- Wind Energy Equipment & Systems
- Wire & Cable
- Wiring Devices
- **And so much more!**

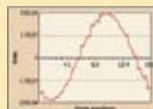
2011 Exhibitor List (List as of 11/22/10)

View the latest products, services and innovative solutions from the industry's leading suppliers.

- Advanced Power Access, Inc.
- AEMC Instruments
- Aitelong Technology
- Alcan Cable
- American Polywater Corporation
- Alumen 8
- AVO Training Institute
- Bad Dog Tools
- Burndy
- Carhart
- CentroSolar America
- CITEL, Inc.
- Mister Sparky
- Condux International, Inc.
- ConEst Software Systems
- Copper Development Association, Inc.
- DC Power/Solar Depot
- Dranetz
- EC&M Magazine/Electrical Wholesaling
- The Electrical Advertiser
- Electrical Contractor Magazine
- Electrical Products & Solutions
- Electrical Solutions
- Exaktime
- Falcon Electric, Inc.
- Flir Systems
- Functional Devices, Inc.
- Gensco Equipment
- Greenlee, A Textron Company
- Harger Lightning & Grounding
- The Home Depot
- Ideal Industries, Inc.
- I-Gard Corporation
- ILSCO
- Infrared Training Center
- Magnelab, Inc.
- McCormick System, Inc.
- Megger
- NFPA
- Northwest Lighting Systems Company
- Partex Marking Systems
- PG LifeLink
- Power & Tel
- Precision Paragon
- Prosurge Electronics Co, Ltd.
- Rennsteig Tools Inc.
- Salisbury by Honeywell
- SAS Safety
- SessionSolar
- Shermco Industries
- SmartGuard Products
- SolarWorld America
- Solon Manufacturing Co.
- S-P Products, Inc.
- Summit Technology, Inc.
- Surge Suppression Incorporated
- The Technology Xchange
- Trade Service
- Underground Devices, Inc.
- Underwriters Laboratories Inc.
- Verve Living Systems
- Walters Wholesale
- Yokogawa Corp of America



Renewable Energies Pavilion
Renewable energy remains a hot topic in the industry. This pavilion includes companies displaying products in solar, wind, and geothermal sectors as well as green business.



Power Quality Marketplace
Power Quality is an integral part of the industry. This pavilion features companies showcasing the latest in power quality equipment.

Visit www.electricshow.com for an updated exhibitor list and to find out more information about an exhibiting company.

Special Events

Make new business contacts, discuss industry trends, share ideas and problem solve, while still allowing some time for fun!

Wednesday, February 23 – 9:00 a.m. – 10:00 a.m. – Show Floor Theater

Keynote Address

FREE



Electrical Safety Roadmap:

Where We've Been, Where We're Going, Where We Need To Be

Mary Capelli-Schellpfeffer, MD, MPA

*Principal, CapSchell Inc. and Medical Director,
Loyola Occupational Health Service*

Globalization of industry and commerce is likely to drive increasing demand for energy. Electrical safety challenges can reasonably be expected to escalate with the growing complexity of inter-connected legacy infrastructure as well as new construction of generation, transmission, and distribution. This presentation reviews historic accomplishments and targets future milestones in the safe operation of electrical systems.

Mary Capelli-Schellpfeffer, MD, MPA is a principal with CapSchell, Inc., where since 1999, she has continued electrical safety research and education activities through consulting; multi-year projects on electric arc injury parameters and prevention; and research collaborations.

She is a Fellow of the Institute of Electrical and Electronics Engineers, Inc. (IEEE), and Past Chair of the IEEE Industry Applications Society (IAS) Petroleum and Chemical Industry Committee (PCIC) Safety Subcommittee. She has also chaired the National Fire Protection Association (NFPA) 70E Future Directions Task Group, exploring emerging opportunities for the advancement of electrical safety. An author of editorials, scientific reports, book chapters, and articles addressing electrical incident mitigation and health effects, she received the degrees of B. A. in Economics from Carthage College; M.D. from the University of Florida; and M.P.A from the University of Wisconsin-Parkside. She is licensed in Indiana, Illinois, Maryland, and Wisconsin and serves as the Medical Director for the Loyola University Health System's Occupational Health Services in Chicago, IL.

Thursday, February 24 – 9:15 a.m. – 10:30 a.m. – Show Floor Theater

Ask the Experts

FREE



Ask the Experts

Moderator:

Sam Wheeler,

Energy Consultant

Join host Sam Wheeler and our panel of industry experts on Code Changes, Safety, Surge Protection, Lighting, Design, Data Centers and so much more. The Experts Panel for Electric West 2011 is the perfect opportunity to ask your industry and technical questions to our panelists. These experts have a wealth of information to share. Hear what's new in technology and how things might look in the future.

Panel of Experts to include:

John DeDad, Training Specialist, GE Energy - Industrial Solutions - Electrical Distribution

David Nichols, Stationary Power Product Manager, Altairnano

David Brender, P.E., National Program Manager, Copper Development Association, Inc.

Brad Roberts, Power Quality Systems Director, S&C Electric Company

Be sure to submit questions prior to the session, visit www.electricshow.com and click on the "Ask the Experts" icon on the homepage.

Thursday, February 24 – 12:00 p.m. – 1:30 p.m. – Show Floor Theater

Lunch n' Learn



NEW

Plug-In Electric Vehicles: Getting PEV-Ready **Dick Cromie, Program Manager -** *Advanced Technology, Southern California Edison Company*

How will the introduction of plug-in vehicles (PEVs) change the current landscape for electrical professionals, utilities, contractors, designers, businesses, and consumers? We need to know what to expect, and how to prepare for this new roll-out – first on the small-scale, but eventually on toward the mass market.

This program will cover the work done by Southern California Edison (SCE) to make sure that consumers, businesses and government have what they need to be “PEV Ready.” SCE will also share some results from recent consumer research done in conjunction with EPRI on charging preferences.

You will leave with insight on the following:

- ◆ PEV Adoption forecasts
- ◆ What consumers say they want
- ◆ An overview on the types of cars and trucks in the pipeline
- ◆ Charge station options, impacts and opportunities
- ◆ Public infrastructure incentives and partnerships
- ◆ Charging Infrastructure challenges
- ◆ Business opportunities for charging
- ◆ How SCE can help you get PEV-Ready

You can't afford to miss this Lunch n' Learn program. Get the insight you need in order to be part of this new future. Continuous feedback will influence the design and operation of the electricity infrastructure, the cost of recharging, your business potential, the overall economy, and environmental quality.

Dick Cromie has worked for Southern California Edison in Major Account Management and Electric Transportation since 1994. He manages various SCE partnerships and collaborations with automakers, infrastructure providers and USDOE FreedomCAR to advance plug-in vehicle development, grid integration and PEV readiness.

Dick graduated from Lehigh University in Engineering, and received his MBA from Indiana University. His experience with electric power system design, advanced metering and communications came from assignments with Westinghouse and Scientific Atlanta.

He is past chairman of the Los Angeles chapter of the IEEE Power Engineering Society, and has authored papers and technical reports for EPRI on load management reliability, non-road EV load shifting, transport electrification and PEV consumer research.

Separate registration is required for the Lunch n' Learn program; includes boxed lunch – please see page 17 for pricing and registration details.

See back cover to register. Includes boxed lunch.

Conference Program

Building on the Past and Moving Toward the Future!

2011 is a Code Change Year – Acquire the Information & Gain the Credits You Need to Stay Current!

Year after year, electrical contractors, consultants, engineers, plant managers, and other electrical professionals come to Electric West to learn about all aspects of the electrical design, construction and maintenance industry. Electric West's content provides you with the tools you need to become more efficient, work faster and more profitably, and to stay ahead of the competition. 2011 is a particularly important year for those who need to stay current on Code Changes. The program offers a variety of code courses to help you address this.

Professional Advancement Courses – February 22, 2011

These full- and half-day programs offer participants an opportunity to immerse themselves in a topic of interest, and earn CEUs and/or Professional Development Hours while doing so. Please see pages 10-11 for descriptions of the workshops.

NEC® Workshops – February 22 & 23, 2011

Renowned NEC® authority, Mike Holt, will cover the following National Code Change workshops:

NEC1: Understanding Important NEC® Requirements – February 22, 2011 – 8:30 a.m. – 5:00 p.m.

(see page 10 for full description)

NEC2: Grounding versus Bonding - February 23, 2011 – 8:30 a.m. – 5:00 p.m.

(see page 12 for full description)

Core Conference Program - February 23-24, 2011

Attend the Conference Program Wednesday through Thursday to get the information you need on Alternative Energy, Emerging Technologies, Lighting Design, Power Quality, Professional Development, and Voice/Data Security.

Conference Topical Track Designations

Electric West's conference program offers the following Track Designations to help you identify the content that you are looking for. Only conference sessions are assigned to tracks, not NEC Workshops or Professional Advancement Courses. The Tracks include:

Track Designation Content Icons:

BP = Business Practices & Profitability

CC = Code Changes & Standards

DE = Design

LI = Lighting

MT = Measurement & Testing

PQ = Power Quality & Reliability

RT = Renewable Technologies/Green Business

RA = Residential/Industrial/
Commercial Applications

SA = Safety

 = Roundtable

 = Hot Topic

Roundtables



Interactive Peer Learning – Sign up onsite for moderated Roundtables that provide you an opportunity to learn from your peers. Join a lively, face-to-face brainstorming exchange with your peers.

Find out how they're tackling issues and share best practices. Roundtables are moderated; small-group; limited seating. Topics are diverse and relevant to your electric industry challenges. Spot-on challenge sharing is encouraged in this format. No vendors will be allowed.

PLEASE NOTE: You must sign up onsite near Registration for the Roundtables. Only 20 participants/sign-ups will be allowed into the Roundtable rooms; be sure to sign up early to ensure your spot.

CEUs/PDHs Information

Many professional organizations require continued learning to stay current with changing technology, procedures, practices, standards, and equipment. Most jurisdictions use Professional Advancement Hours (PDHs) and Continuing Education Units (CEUs) to measure and log training and education. Participation in the Electric West conference may meet part or all of your organizations' requirements for ongoing training and education. Electric West will provide you with a Certificate of Completion for each of the sessions you attend in full. Many organizations may accept this Certificate as proof for PDHs. It is up to the attendee to determine what conference activities meet their organizations' requirements for continuing education.

Conference Leadership Provided by: **EC&M**

Electrical Construction & Maintenance (EC&M) magazine is the technical authority for 130,000+ electrical professionals, including 80,000+ subscribers in electrical contracting firms (reaching all NECA and IEC member firms and ENR's top 50), 30,000+ subscribers in industrial plants and in commercial/ institutional facilities with 100+ employees (93% coverage of Fortune 1000 firms), and 20,000+ consulting electrical engineers. EC&M offers a mix of in-depth technical articles, market and construction forecasts, and comprehensive product reviews. In addition to the print publication, EC&M also produces five high-quality e-newsletters. Visit www.ecmweb.com for details.

Conference Hours

Tuesday – February 22, 2011

8:30 a.m. – 5:30 p.m. NEC1 and Professional Advancement Courses
(All Tuesday workshop options include lunch coupons)

Wednesday – February 23, 2011

8:00 a.m. – 5:00 p.m. Conference Sessions
8:30 a.m. – 5:00 p.m. NEC2 *(includes lunch coupon)*
9:00 a.m. – 10:00 a.m. Keynote Address
10:00 a.m. – 6:00 p.m. Exhibit Hall Open

Thursday – February 24, 2011

8:00 a.m. – 4:30 p.m. Conference Sessions
9:15 a.m. – 10:30 a.m. Ask the Experts Panel
10:00 a.m. – 5:00 p.m. Exhibit Hall Open
12:00 p.m. – 1:30 p.m. Lunch n' Learn *(requires separate registration)*

Advisory Committee

Electric West is proud to announce that we have assembled an Advisory Committee for the event. This group of exhibitors, speakers, and attendee customers has already been very instrumental in providing feedback and guidance on the event. We'd like to personally thank them for their ideas and support.

David Moore, *President*
Moore Electric, Inc.

Ted James, *Professor*
Pasadena City College

Jeff Rivera, *Professor - Electrical Technology*
Elizabethtown Community & Technical College

Tom Butcher, *V.P. Technical Services*
Surge Suppression Incorporated

David Pugh
Pugh Consulting

Jim Sahrman, *Account Manager*
Guarantee Electrical Company

Michael Lowenstein, *President*
MZL Enterprises

James Mathews, *NCOIC, Interior Electrical Systems*
USAF

David Danner
MEGGER

Lynne Jacob, *Business Coach, Business Strategies Trainer*
MLJ Coaching International

Randy Wilson, *Marketing*
Sol Inc.

Sam Wheeler
Energy Consultant

Brad Roberts, *Power Quality Systems Director*
S&C Power Quality Products Division

Mohan Ray, *Sr. Facilities Design Engineer*
Northrop Grumman Corporation

Michael Hughes, *LEED Accredited Professional*
Bergelectric Corporation

If you are interested in joining our Advisory Committee
please contact Florence Torres directly at Florence.Torres@penton.com

Association Partners to date Include:



Schedule-at-a-Glance

Tuesday, February 22

TIME	TRACK	ID NUMBER	TITLE
8:30 a.m. – 5:00 p.m.	CC	NEC1	Understanding Important NEC® Requirements
8:30 a.m. – 5:30 p.m.	PQ	PAC1	Surge Protective Devices - Design, Installation and the ANSI/UL 1449-2006 (3rd Edition) Standard
	CC	PAC2	IAEI's Analysis of 2011 Code Changes
	RT	PAC3	IAEI Photovoltaic Systems
8:30 a.m. – 12:30 p.m.	RA	PAC4	Smart Grid – If You Don't Know Where You Are Going, Any Road Will Get You There!
	SA	PAC5	NFPA 70E - 2012 Electrical Safety Requirements
	LI	PAC8	Retrofitting Lighting and Controls – Best Strategies, Rebates and Tax Breaks
1:30 p.m. – 5:30 p.m.	BP	PAC6	Essential Elements of Electrical Estimating
	RT	PAC7	Training Electricians for the Energy Future
	LI	PAC9	Latest Lighting Energy Code Updates: California Title 24 2008 – ASHRAE-IES 2010 – IECC 2009 Lighting

Wednesday, February 23

TIME	TRACK	ID NUMBER	TITLE	
8:30 a.m. – 5:00 p.m.	CC	NEC2	Grounding versus Bonding	
8:00 a.m. – 9:00 a.m.	RA	W1	Guiding Principles for Data Center Energy Efficiency Metrics	
	CC	W2	Common NEC Violations	
	RT	W3	Profitable Careers in Sustainable Energy	
	MT	W4	Motor Maintenance and Testing	
	BP	W5	How Project Managers Can Increase Cash Flow	
9:00 a.m. – 10:00 a.m.	Keynote Address: <i>Electrical Safety Roadmap: Where We've Been, Where We're Going, Where We Need to Be - Show Floor Theater</i>			
10:00 a.m. – 6:00 p.m.	Exhibit Hall Open			
11:30 a.m. – 12:30 p.m.	RT	W6	Wind Power Plant Protection	
	SA	W7	Arc Flash Hazard Mitigation Methods: Benefits and Limitations	
	BP	W8	How to Overcome the Top 3 Challenges in Your Contracting Business	
	BP	W9	Labor Units: Factors to Consider for the Most Competitive Bid	
	MT	W10	Sizing Conductor and Selecting Equipment Grounding Conductor	
2:30 p.m. – 4:30 p.m.	CC	HT1	Understanding the 2009 International Energy Conservation Code – Electrical Section 505	
		RT	HT2	Alternative Energy Systems and Surge Protective Devices – How to Protect Your Investment
		LI	HT3	LED Lighting: Ready or Not?
2:30 p.m. – 3:30 p.m.	ALL	W11	What's Wrong Here – Ripped from the Pages of EC&M	
	BP	W12	Advanced Lawsuit Protection, Tax Reduction and Estate Planning Strategies for Electric Industry Professionals	
	PQ	W13	Making Dollars & Sense of Power Quality	
	DE	W14	Large Scale Battery Backup Systems	
	SA	W15	Qualified Persons and Electrical Hazards	
4:00 p.m. – 5:00 p.m.	BP	W16	Hot Electrical Markets for 2011	
	DE	W17	Selective Coordination Using Circuit Breakers	
	PQ	W18	Surge Protective Devices – How to Improve Protection and Economize	
	RT	W19	Solar Power Generation – The Utility Perspective	
	BP	W20	ROUNDTABLE: Managing and Improving Job Site Productivity	

Schedule-at-a-Glance

Thursday, February 24

TIME	TRACK	ID NUMBER	TITLE
8:00 a.m. – 9:00 a.m.	RT	T1	20 Ideas in 60 Minutes: Green LEED Applications
	RA	T2	Safety Considerations for Installing Transfer Switches
	DE	T3	Getting it Off the Roof Top – New Ways to Approach Solar
	PQ	T4	Mitigating PQ Problems in Legacy Data Centers
	CC	T5	ROUNDTABLE: PacifiCorp Six-State ESR – Electric Service Requirements by PacifiCorp
9:15 a.m. – 10:30 a.m.	Ask the Experts -- Show Floor Theater		
10:00 a.m. – 5:00 p.m.	Exhibit Hall Open		
11:00 a.m. – 12:00 p.m.	RA	T6	UPS & Generator Commissioning
	SA	T7	NFPA 70E – 2012 Changes
	PQ	T8	Is There a Connection Between Power Quality & Reliability?
	BP	T9	Energy Industry Contracts for Non-Lawyers
	RA	T10	Energy Efficient Electrical Equipment and the Role of Copper
12:00 p.m. – 1:30 p.m.	Lunch n' Learn – Plug-In Electric Vehicles: Getting PEV-Ready		
2:00 p.m. – 3:00 p.m.	MT	T11	Ground Testing: Matching Instrumentation & Techniques to Applications
	BP	T12	Good Project Management: Improving the Bottom Line
	RA	T13	How to Perform a Power Survey
	BP	T14	What to Expect from an Estimating System
	RT	T15	ROUNDTABLE: Green Careers
3:30 p.m. – 4:30 p.m.	SA	T16	A Holistic Approach to Electrical Safety
	RA	T17	Higher Voltage DC (HVDC) Power Solutions for Critical Power Environments
	PQ	T18	A Case Study Roadmap to Preventing Power Quality Problems
	ALL	T19	What's Wrong Here – Ripped from the Pages of EC&M

Track Designation / Content Icons:

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Commercial Applications

SA = Safety



= Roundtable



= Hot Topic

Conference Program – NEC and Professional Advancement Courses Tuesday, February 22

Track Designation / Content Icons:

BP = Business Practices & Profitability	RA = Residential/Industrial/ Commercial Applications
CC = Code Changes & Standards	SA = Safety
DE = Design	 = Roundtable
LI = Lighting	 = Hot Topic
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Tuesday, February 22
NEC Workshop
8:30 a.m. – 5:00 p.m.

NEC1

CC

Understanding Important NEC® Requirements

Mike Holt, President & CEO, Mike Holt Enterprises, Inc.

Electrical professionals have the responsibility to ensure a safe code-compliant system that is designed, installed, and inspected to meet National Electrical Code® requirements. Knowledge of the 2011 NEC® and the most recent changes is critical for success, so attend this session to get an edge on your peers and competitors. Mike Holt will bring accurate, in-depth coverage of the most important 2011 NEC® requirements and changes, in a fun and dynamic manner, and with visuals and illustrative examples that highlight today's electrical installations. Learn the basics as well as the advanced concepts needed for practical NEC® requirements for systems not over 600V.

The goal of this full-day session is to provide guidance on proper electrical installations, troubleshooting, and advice on seemingly conflicting NEC® rules. This is a 'must attend' session if you're an electrician, contractor, engineer, designer, or plant/facility maintenance person.

Note: This program does not include any Grounding and Bonding requirements, these will be covered in NEC2 session.

Tuesday, February 22
Professional Advancement Courses
Full-Day Workshops 8:30 a.m. – 5:30 p.m.

PAC1

PQ SA CC

Surge Protective Devices - Design, Installation and the ANSI/UL 1449-2006 (3rd Edition) Standard

Thomas W. Butcher, Vice President Technical Services,

Surge Suppression Incorporated

Surge Protective Devices (SPDs) are not just for the service entrance. IEEE, ANSI, NEMA and UL all recognize that proper protection requires a systems approach. How do you decide what you need and where? In addition, the new ANSI/UL 1449-2006 Standard has significantly changed the testing required to achieve a listing from UL or one of the other National Recognized Testing Laboratories (NRTLs). This has resulted in a number of wholesale changes in SPD design by many of the major manufacturers. How do you pick the best SPD manufacturer for your needs?

Topics covered include:

- Industry terms and references
- The transient environment and types of transients
- SPD design types and applications
- ANSI/UL Standard 1449-2006 (3rd Edition)
- SPD specifications
- Proper installation
- Application results
- Comparison testing

The course is certified by IEEE for Professional Development Hours (Continuing Education Units). IEEE issues the CEU certificate for the course.

*Program and Speakers Subject to Change.
Check online for program updates.*

PAC2

CC

IAEI's Analysis of 2011 Code Changes

Keith Lofland, Director of Education, Codes, and Standards, International Association of Electrical Inspectors (IAEI)

This is an extensive and popular program analyzing the major changes to the Code for this cycle. Members of the twenty NEC code-making panels contributed to the development of the authoritative text. This seminar covers more than 250 of the most significant changes in the NEC. The changes discussed include interpretations by the group that enforces the Code. The four-color book, which covers over 300 noteworthy changes, is loaded with illustrations that clearly identify and explain the changes.

This program includes topics such as :

- New definitions
- The new Article 694 for Small Wind Electric Systems
- The newly reorganized Article 310 - a detailed look
- Premise powered broad band systems - Article 840

PAC3

RT CC

IAEI Photovoltaic Systems

Jonathan Cadd, Education Code and Standards Coordinator;

Seminar Specialist - Technical Editor, International Association of Electrical Inspectors (IAEI)

This workshop provides attendees with a dynamic, comprehensive, and up-to-the-minute look at the installation and inspection of today's Solar Photovoltaic Systems. Whether the system is Stand Alone, Hybrid, or the now popular Grid Tied system, this program provides an overview of the major design issues and minimum code requirements related to Solar Photovoltaic Systems.

The program includes topics such as:

- Types of systems
- Disconnecting means and their locations
- The requirements for ground mounted and roof mounted systems
- Types of inverters, combiner boxes, and AC equipment and their installation
- Requirements for grounding and bonding of Solar Photovoltaic Systems both AC and DC

This workshop is a must attend for those that are looking for the definitive program on the ins and outs of PV systems. All material is primarily based on the requirements set forth in Article 690 in Parts I through IX of the National Electrical Code (NEC®).

Tuesday, February 22
Professional Advancement Courses
Half-Day Morning Workshops 8:30 a.m. – 12:30 p.m.

PAC4

RA

Smart Grid – If You Don't Know Where You Are Going, Any Road Will Get You There!

Gene Wolf, Principal Engineer, Lone Wolf Engineering, LLC

The smart grid is much more than a magic black box, but what is real and what is vapor ware. Emerging smart grid technologies are providing some very effective solutions for our challenged industry, but how well do you understand those technologies.

Topics to discuss:

- Intelligent transmission systems – complex but flexible
- Digital distribution systems – which side is hot
- Connected customers – Google vs. the utilities
- Surveying with lasers
- Renewable energy – solar on the patio cover
- Energy storage – ice storage vs. HVAC

We will explore the basic concepts of the smart grid. How it will provide better service, improved reliability, enhanced quality power, and still be environmentally friendly.

Conference Program – NEC and Professional Advancement Courses Tuesday, February 22 & Wednesday, February 23

PAC5

SA CC

NFPA 70E – 2012 Electrical Safety Requirements

Dennis K. Neitzel, *Director Emeritus, AVO Training Institute, Inc.*
This workshop will provide the attendee with the updates for the NFPA 70E-2012 edition along with a better understanding of the electrical safety requirements and how they apply in the workplace. This workshop will focus on the entire NFPA 70E-2012 standard with additional information on the hazards of electrical shock, electrical arc flash, and electrical arc blast, along with the personal protective equipment (PPE) requirements for these hazards. The requirements for electrical safety-related work practices which include the "Arc Flash and Shock Hazard Analysis" will also be addressed. This is a must for anyone who works within the Limited Approach and/or Arc Flash Boundary of exposed energized circuits or parts of electric equipment.

Attendees will:

- Understand the electrical safety requirements of NFPA 70E-2012
- Understand the hazards of electricity
- Understand the requirements for personal protective equipment (PPE)

PAC8

LI BP DE

Retrofitting Lighting and Controls – Best Strategies, Rebates and Tax Breaks

James Benya, P.E., FIES, FIALD, LC, Principal, Benya Lighting Design - Co-author of the new Wiley book "Lighting Retrofit and Relighting: A Guide to Energy Efficient Lighting" (January 2011)

With rising energy costs and decaying infrastructure, lighting retrofits and relighting projects remain at the top of the list of practical projects for all building types. Using a combination of utility company rebates, tax incentives and actual energy savings, lighting projects offer high rates of return and provide long term capital benefits without capital investment. Many relighting projects provide badly needed renewal of building appearance, adding value to the building, paid for through efficiency.

In this workshop you will learn about:

- Discovering suitable projects
- Conducting a lighting audit
- Incentives
- Code implications
- Good retrofit projects
- Good relighting projects
- Controls only projects

Retrofitting and relighting is good business in a down economy, and in many cases retrofitting is required by companies, government bodies and institutions. Come find out how to do it right; includes case study examples.

Tuesday, February 22
Professional Advancement Courses
Half-Day Afternoon Workshops 1:30 p.m. – 5:30 p.m.

PAC6

BP RA

Essential Elements of Electrical Estimating

Michael Hughes, *Estimating Manager, Bergelectric Corporation*

This workshop will provide an overview of the essentials of electrical estimating. You will be exposed to various electrical systems, their components and relative costs. You will learn basic take-off methods and costing procedures to allow you to assemble a professional cost estimate for an electrical scope of work. Additional topics will include takeoff assemblies, labor units, and an understanding of how to deal with today's tough construction market and come out ahead. The American Society of Professional Estimators is sponsoring this comprehensive look at Electrical Estimating.

Participants of this workshop will gain:

- A fundamental knowledge of electrical estimating techniques
- Benefits of developing a professional estimating routine
- A proven method of success for today's tough construction market

PAC7

RT MT

Training Electricians for the Energy Future

S. Mark Florence, *Founder & President, BrawnHumus Inc.*

As America embarks on a green energy revolution, demand for contractors specializing in Energy Efficiency & Renewable Energy technologies has never been greater. Because many of these technologies deal with electrical energy production and consumption, electricians are positioned to lead the way. Now is the time to increase your energy knowledge, skills, and technical expertise.

Learn about the exciting fields of:

- Energy audits for new and existing buildings
- Solar photovoltaic and wind turbine technologies
- Building a team of energy specialists

PAC9

LI CC

Latest Lighting Energy Code Updates: California Title 24 2008 – ASHRAE-IES 2010 – IECC 2009 Lighting

James Benya, P.E., FIES, FIALD, LC, Principal, Benya Lighting Design - Developer and Presenter of "Maneuvering through Lighting Codes, Title 24, ASHRAE/IES 90.1 and IECC" for Southern California Edison, PG&E and SMUD -- Consultant to the California Energy Commission for Title 24-2011 -- Former member, ASHRAE SPC 90.1 and ASHRAE 189.1

Every three years, the major energy codes are revised, and with the growing pressure to reduce energy use nationwide, lighting is at the top of the list for increased restrictions. The latest codes, 90.1-2010, IECC-2009 and Title 24-2008 are across the board 10% or more restrictive than the last codes, with major impacts on retail and exterior lighting. New "green" building codes add to the complexity of the regulatory environment.

This workshop will teach:

- Basic code structure
- Which codes apply where
- The similarities and differences among the energy codes
- Important changes in Title 24-2008
- Important changes in ASHRAE/IES 90.1-2010
- Important changes in IECC-2009
- The implications of ASHRAE /IES 189.1, the IGCC, and the California Green Construction Code
- Related code issues in the NEC® and other standards

Come and get the most comprehensive lighting-related survey and explanation of the ever changing, and ever more strict codes we face today.

WEDNESDAY

Wednesday, February 23
NEC Workshop 8:30 a.m. – 5:00 p.m.

NEC2

CC MT DE PQ SA

Grounding versus Bonding

Mike Holt, President & CEO, Mike Holt Enterprises, Inc.

"Grounding versus bonding" of electrical systems, sensitive electronic, and communications equipment is the most important and least understood activity in the electrical, data process and communications industry. This session will explain the grounding fundamentals in an informal and relaxed style using PowerPoint 4-color graphics and examples that apply to today's electrical installations. Those attending this high-energy session will learn the basics as well as the advanced concepts necessary to understand the practical grounding and bonding rules in the NEC® for systems not over 600V.

This full-day workshop will help attendees understand concepts necessary to design, install, inspect, measure and troubleshoot electrical systems, and to help clear up confusing and seemingly conflicting or controversial NEC® rules. Attendees will receive tips on proper electrical installations, advice and cautions regarding possible conflicts or confusing code rules, and warnings of dangers related to improper electrical installations.

Wednesday, February 23
Conference Program – Concurrent Sessions
8:00 a.m. – 9:00 a.m.

W1

RA MT CC

Guiding Principles for Data Center Energy Efficiency Metrics

David Schirmacher, *Vice President, 7x24 Exchange*

Operating a data center is an increasingly complex proposition in today's business environment. Rapid growth, changing technologies, pressure to manage expense, and the potential for increased regulation are all factors that data center operators must address on a daily basis. This presentation will review the challenges facing the industry and offer recommendations that leverage business intelligence to drive decisions.

Topics covered in this session will include:

- The changing landscape of data center performance measurement
- Challenges to creating and executing a performance management program
- Review of the new EPA/DOE performance metrics recommendations
- Review of the DC Performance Stack
- How best practice organizations leverage information to drive performance

7x24 Change
INTERNATIONAL
The end-to-end reliability forum.

Program and Speakers Subject to Change. Check online for program updates.

Conference Program – Wednesday, February 23

W2

CC

Common NEC Violations

Dirk Burton, CEO, Able Electric Co.

Is your wiring up to code? Do your electricians know where they should strap the conduit? Is it a hazard to have grounds and neutrals and grounds bonded together? Are your electrical installations safe?

Find answers to these questions and other that may affect the way we live and work by learning about common NEC violations.

- Find NEC Violations in real life situations
- Learn how to resolve common NEC Violations
- Learn to do it right the first time. Saving money and time
- Improve your reputation
- Speak intelligently with AHJ

W3

RT

Profitable Careers in Sustainable Energy

Bob Oedy, Sustainability Expert & Author of the Book The Green Career Ladder; A Step-by-Step Guide to Profitable Careers in Sustainable Energy

Where are the Green Jobs today? What are employers looking for? Where can you find the best training? Whether you are new to the job market or just changing careers this session will help you design your dream Green career. Participants will be provided a template to design your own personal Green career plan in industries such as wind, solar, biomass, geothermal power, Green building, and retrofitting.

- Why Green is finally here to stay
- Chart your own path to success
- Build a Green-focused resume
- Learn ideas to help you stay on-track
- Position yourself for maximum growth with today's most innovative companies

Discussion will focus on hidden opportunities for launching a profitable and rewarding Green career.

W4

MT

PQ

Motor Maintenance and Testing

Tim Gauthier, Senior Training Specialist, AVO Training Institute, Inc.

The key to minimizing motor problems is scheduled motor maintenance and testing. The cost effectiveness of a motor maintenance program depends upon whether or not the motor running until it quits is the maintenance down time or if a sound maintenance program is in place for preventative maintenance and scheduled down time is allocated to perform predictive maintenance testing.

Topics covered for Motor Maintenance include:

- Bearing lubrication, heat, noise and vibration, windings, and brush and commutator care

Topics covered for Motor Testing include:

- Insulation-resistance testing, dielectric-absorption testing, over-potential testing, surge-comparison testing, three-phase four-wire neutral-current testing, and variable frequency drive testing

W5

BP

How Project Managers Can Increase Cash Flow

David Brown, Principal, D. Brown Management

Inadequate cash flow kills more construction businesses than poor profitability. Learn techniques from startup through project close-out that can be used to improve cash flow – and profitability. These ideas are all based on real-world experience and projects including how to use ForeFront to streamline and manage the processes.

You will:

- Learn a variety of tactics that you can use to improve cash flow
- Receive operations-level details that affect cash flow

Geared toward anyone directly involved in the management of projects, project managers or financial managers, this session includes worksheets and ideas that can be put to use immediately in your business.



Keynote Address

9:00 a.m. – 10:00 a.m.

Show Floor Theater

FREE

to All Attendees

**Electrical Safety Roadmap:
Where We've Been, Where We're Going
Where We Need To Be**

Mary Capelli-Schellpfeffer, MD, MPA, Principal, CapSchell Inc. and Medical Director, Loyola Occupational Health Service

See page 4 for full description

Keynote Presentation will cover the following Tracks:

SA

PQ

CC

Concurrent Sessions 11:30 a.m. – 12:30 p.m.

W6

RT

Wind Power Plant Protection

Ernst Camm, Principal Engineer, Power Systems Services, S&C Electric Company

Protection of large wind power plants present unique challenges to protection engineers.

This session will include detailed discussion on protection of:

- Transmission lines connecting the wind power plant to the Point of Interconnect (POI)
- The main power transformer
- The collector substation bus
- Reactive compensation equipment in the collector substation
- The collector system
- Wind turbine generator step-up transformer
- Wind turbine generator

W7

SA

CC

MT

RA

PQ

Arc Flash Hazard Mitigation Methods: Benefits and Limitations

John DeDad, Training Specialist, GE Energy - Industrial Solutions - Electrical Distribution

Protection against arc flash and arc blast is an important requirement in the operation and maintenance of power distribution systems. There are several methods that can limit the amount of exposure.

This session will discuss various methods and provide insight and arguments on how to apply them:

- Arc resistant equipment
- Current-limiting breakers and fuses
- Faster and more sensitive circuit breakers
- Remote operation
- Temporary settings
- Crowbar systems
- PPE
- Containment systems

*Program and Speakers Subject to Change.
Check online for program updates.*

Track Designation / Content Icons:

BP

= Business Practices & Profitability

CC

= Code Changes & Standards

DE

= Design

LI

= Lighting

MT

= Measurement & Testing

PQ

= Power Quality & Reliability

RT

= Renewable Technologies/Green Business

RA

= Residential/Industrial/
Commercial Applications

SA

= Safety



RT

= Roundtable



HOT
TOPIC

= Hot Topic

W8

BP

How to Overcome the Top 3 Challenges in Your Contracting Business

Mary Lynne Jacob, *Business Success Coach, MLJ Coaching International*

Quadruple your Fun...which will Cause your Profits to Triple Themselves! In just 1 hour you will see that you're not alone in your struggles with these Top 3 Challenges: three BIG holes in the foundation of your business.

You'll receive valuable training on:

- Identifying the root of the problems (the disease as opposed to the symptoms you spend so much time dealing with)
- Suggestions on easily FILLING the holes, rather than just paring the cracks
- How to drastically increase your own productivity, easily, and lead your teams to do likewise
- How to eliminate the "feast or famine" in your business, with simple tactics to keep business coming in consistently and persistently... as Gary has done even through the fluctuating Southern Californian economy
- How making simple improvements to your "decision-making" system, will strengthen, improve and grow your business... in every economy



2:30 p.m. – 4:30 p.m.

HT1

CC

LI

RA

PQ

Understanding the 2009 International Energy Conservation Code- Electrical Section 505

Marty Schumacher, *President, M.S. Electrical Training, LLC*

The energy codes and the electrical contracting industry are merging faster than ever. Most states, counties and local jurisdictions are requiring energy code design and installations.

Stay on top and learn these new energy code requirements.:

- Controls, switching and wiring
- Lighting power allowances
- Plan review submittals and compliance calculations
- Occupancy sensors
- Resolving conflicts with exit, emergency and security lighting
- Practical applications for commercial buildings, interior completions and expansions
- What is REScheck and COMcheck
- Combining the NEC® and the IECC

Discussion will focus on understanding and applying electrical section 505 of the IECC.

W9

BP

RA

Labor Units: Factors to Consider for the Most Competitive Bid

George Hague, *President & CEO, ConEst Software Systems*

Competitive construction bidding is one of the biggest gambles made by contractors in the electrical industry. Successful contractors know all their labor and material costs, and add an accurate overhead percent and a reasonable profit margin to create winning bids. A successful electrical estimate is based on calculating material installation time down to the labor unit. Estimators typically use labor units published by nationally recognized associations and/or estimating systems, but in order to calculate accurate labor costs an estimator must understand that a labor unit is not absolute; a labor unit is only a benchmark - a starting point.

Session attendees will learn:

- The many aspects that must be considered when calculating labor units for a bid.
- How to most effectively adjust labor units for material installations within an estimate.
- The technology available to automate calculation of labor units in the bidding process.

Using illustrative examples, handouts and group-discussion, this session will help contractors and estimators learn how to apply labor unit data to specific material installations for more accurate estimates and competitive bids.

HT2

RT

CC

SA

PQ

Alternative Energy Systems and Surge Protective Devices (SPDs) - How to Protect Your Investment

Thomas W. Butcher, *Vice President Technical Services, Surge Suppression Incorporated*

Solar and Wind Power systems are replete with electronics and controls. Inverters, controllers, AC power, DC power and data lines are all susceptible to lightning and surge damage. It is possible to protect these systems with the right SPDs, at the right locations, with the right installation.

The presentation will cover the following areas:

- How these systems work and what areas are at risk
- What types of SPDs are required to protect the systems
- Where should the SPDs be placed in the system to provide proper protection
- How should the SPDs be installed
- How will improper installation effect SPD protection levels

IEEE recognizes this session content for Professional Development Hours (Continuing Education Units). IEEE issues the CEU certificate for the session.

W10

MT

DE

RA

CC

Sizing Conductor and Selecting Equipment Grounding Conductor

Aisha Bajwa, *Field Applications Engineer, Alcan Cable*

In order to design a safe electrical system, it is very important to determine a proper conductor size. This presentation focuses on conductor selection affected by ampacities, correction factors, adjustment factors as well as loads. Ampacity ratings and the use of equipment grounding conductor (NEC® Article 250.122) will be covered in detail.

Information will be given on:

- Conductor selection using the allowable Ampacity Tables
- Use of ampacity correction factors for high ambient temperatures and for excessive conductors
- Basic principles to identify equipment grounding conductor
- sizing of equipment grounding conductor
- conductors in parallel, and size increase

This session will help electricians, electrical contractors, and design engineers to calculate conductor size and how to select an equipment grounding conductor under different scenarios.

HT3

LI

LED Lighting: Ready or Not?

Dr. Jack Curran, *President, LED Transformations, LLC*

New LED products are appearing in the market rapidly—some very good, some not so good—and buyers must quickly learn how to determine which products will best suit their lighting needs. Exaggerated performance claims, poorly understood product specifications, and apples to oranges comparisons cloud the picture and prompt considerable confusion. This Hot Topic session will explain how LEDs differ from traditional lighting sources, introduce basic terminology, outline the components that make up an LED system, and explain how they interact. Taught by a vendor-neutral expert from DOE's Solid-State Lighting Program, attendees will learn what tools are available to help evaluate LED products and when to take advantage of this new lighting technology.

Link to Monthly "Postings" from the desk of Jim Brodrick, DOE: http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/postings_09-14-10.pdf

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Commercial Applications

SA = Safety



= Roundtable



= Hot Topic

Conference Program – Wednesday, February 23

Concurrent Sessions
2:30 p.m. – 3:30 p.m.

W11

BP

CC

DE

LT

MT

PQ

RT

RA

SA

What's Wrong Here – Ripped from the Pages of EC&M Joe Tedesco, *NEC Consultant, Tedesco Electrical Code Consultants, Inc.*

This session will review some of the worst electrical fire, shock, and safety hazards Joe has discovered that were published in the EC&M CodeWatch, Illustrated Catastrophes, and What's Wrong articles here since the beginning!

- Learn how to find some of the same hazards in your area
- See how you can identify the electrical code references that apply
- Learn how to recognize these types of hazards and work that was done by unqualified persons

Test your skills now -

Can you identify the Code violation(s) in this photo?



How well do you know the Code?

Think you can spot violations the original installer either ignored or couldn't identify? Here's your chance to moonlight as an electrical inspector and second-guess someone else's work from your chair.

Can you identify the Code violation(s) in the photo?
Attend the session for tons of these visual examples.

W12

BP

Advanced Lawsuit Protection, Tax Reduction and Estate Planning Strategies for Electric Industry Professionals

Dale West, *Senior Advisor, American Society for Asset Protection*

Is your Financial house in order? Discover the tools you can use to become invincible to lawsuits, save thousands in taxes, and achieve financial peace of mind.

By the end of the presentation, you will know how to:

- Structure business for lawsuit protection and prevention
- Reduce liability insurance costs
- Minimize taxes
- Create a successful estate and business succession plan

W13

PQ

BP

Making Dollars and Sense of Power Quality

Wade Thompson, *Sr. Sales Support Engineer, Fluke Electronics Corporation*

Power quality issues cost you valuable time and money. In this session we will explore how power quality impacts your facility and bottom line. Understanding what it is, where to look and what you can do about it.

- Fundamentals of power quality
- Industry standards around power quality
- Symptoms, causes and solutions
- Intermittent or premature equipment failures
- Energy saving and cost reduction
- Utility billing and programs

W14

RA

DE

Large Scale Battery Backup Systems

David Nichols, *Stationary Power Product Manager, Altairano*

Energy storage has the ability to transform the electricity grid to more effectively respond to changes in energy generation, delivery, and utilization. Management of electrical grids with energy storage is becoming an increasingly important and cost effective solution to meet energy delivery challenges. Advances in energy storage, communications, and inverter technology make innovative Smart Grid strategies a reality.

Key Takeaways:

- Better understand energy storage electrical power system applications
- Learn needed ES attributes for these applications
- Hear an introduction to lithium-titanate battery technology
- Get results from PJM frequency regulation application

W15

CC

SA

Qualified Persons and Electrical Hazards

Steven J. Owen, *President, National Code Seminars*

What questions need to be asked with respect every company's electrical safety program? What is the big deal? Why can't the office secretary and other (unqualified) personnel turn circuit breakers and safety switches on and off when they want to? Why can't any persons (qualified or unqualified) approach exposed, energized electrical circuits, parts and electrical equipment without appropriate training and skill level? What is the importance of the term "qualified person"? Are there job tasks, specific or non-specific, that require qualified persons to perform such tasks?

This session will answer the pertinent questions you need to ask:

- Who needs to be qualified?
- What are the necessary requirements per OSHA and NFPA 70E to determine whether a person is qualified or not?
- Who has the responsibility to determine who is qualified?
- Is there a relationship between qualified persons and electrical hazards?
- If there is no relationship between qualified persons and electrical hazards why do we bother with defining the term and applying the definition?

Learn what you should be doing to prepare your business properly.

Concurrent Sessions
4:00 p.m. – 5:00 p.m.

W16

BP

Hot Electrical Markets for 2011

Jim Lucy, *Chief Editor, Electrical Wholesaling and Electrical Marketing magazines*

Looking for new sales opportunities that will fuel your businesses in the 21st century? Now that the economy is starting to bounce back, electrical companies are looking for the market niches and sales opportunities that will help them grow in 2011 and beyond.

Join Jim for insight on the following:

- A glimpse at 2011 sales forecasts for the electrical market
- An update on developing sales opportunities such as residential voice-data-video (VDV), lighting retrofits and renewables
- How to estimate the sales potential of these hot markets
- Identifying the geographic markets rebounding the fastest

This session is beneficial for both attendees and exhibitors.

W17

DE

CC

Selective Coordination Using Circuit Breakers

Benjamin Medich, *P.E., Associate, Senior Project Electrical Engineer, Ballinger*

Electrical codes and local authorities have been expanding the scope of selective coordination requirements and their enforcement in recent years. As a facilities manager, owner, contractor or engineer, selective coordination is a topic that you need to understand.

This session will give an overview of selective coordination, with important information on the following coordination topics:

- What is selective coordination?
- Which systems are code-required to be selectively coordinated?
- How can I achieve coordination using circuit breakers?
- Can I achieve selective coordination without using electronic breakers?
- How does selective coordination affect arc flash?
- What about ground faults?

Conference Program – Wednesday, February 23 & Thursday, February 24

W18**PQ**

Surge Protective Devices - How to Improve Protection and Economize

William Goldbach, Principal, WGoldbach Associates, LLC

There has been an increasing industry trend to increase surge ratings, and the surge ratings keep rising, why? This session will show the reason and present the facts for all to understand how protection can be increased and costs reduced. Included will be how marketing has driven this industry.

- Understand the trend and why
- How to use this information in your specifications
- Increase your protection and lower costs
- What questions to ask

W19**RT****RA**

Solar Power Generation - The Utility Perspective

Russ Harding, Manager, Solar Rooftop Program, Southern California Edison Company

This presentation provides an overview of Southern California Edison's (SCE) Solar Rooftop Program. This innovative program enables building owners to demonstrate environmental stewardship by leasing under-utilized roof space or land to SCE so it can install solar photovoltaic panels, allowing 250 megawatts (MW) of clean solar energy to be sent directly to the electric grid.

The presentation will discuss several aspects of the program, including:

- Program status
- The technology used
- Challenges
- Lessons learned

W20**BP****RA**

ROUNDTABLE: Managing and Improving Job Site Productivity

David Brown, Principal, D. Brown Management

Maintaining Job Site Productivity is one of the most important activities for any foreman, superintendent, or project manager. If your production rates are left at lower levels, and you adjust your estimating to match production rates, you will become uncompetitive in the marketplace. How are you defining productivity? How are you measuring it? Many factors affecting productivity rates are well within your control. Bring your challenges to discuss; learn tips to improve your production rates.

THURSDAY

Thursday, February 24
Conference Program – Concurrent Sessions
8:00 a.m. – 9:00 a.m.

T1**RT****MT****LI****PQ**

20 Ideas in 60 Minutes: Green LEED Applications

Mohan Ray, Sr. Facilities Design Engineer, Northrop

Grumman Corporation

Roger O'Donnell, Area Sales Manager, Industrial, Government and Institution

Markets, Eaton Corporation

Review primary elements of power management including both power consumption and power quality issues. Metering and Monitoring are the essential tools for measurement and verification of LEED certification. Software tools will be discussed that can establish baseline usage information as well as provide condition alerts vital to operations.

Ideas to be discussed during the session also include:

- Potential negative impact of harmonics and poor power factor
- Mitigation strategies
- Implementation strategies including demand response, load leveling, energy audits and utility rebates
- Financial benefits in support of conservation initiatives

T2**RA****MT****SA**

Safety Considerations for Installing Transfer Switches

Neil Czarnecki, P.E., Vice President - Engineering, Reliance Controls Corporation

The increases in instances of power outage in the U.S. have created an increased interest by the general public in standby power. Unfortunately, misinformation abounds as to methods for connecting generator power to a residence, including a lack of understanding of the legal and safety requirements for a transfer switch. This session is intended to acquaint the professional with the wide variety of available generator/transfer switch configurations and the decisions the end-user must make to specify a system.

Topics covered will include:

- Permanently installed or temporary?
- Automatic or manual?
- Whole-house or partial?
- Subpanel or load-side?
- Separately derived or non-separately derived?
- Third-party certified or CE-marked?

T3**RT****DE****BP**

Getting it Off the Roof Top - A New and Innovative Approach to Solar Installation

Ted James, Professor Electrical Technology Programs, Pasadena City College

Sam Abedzadeh, Instructor Electronics/Electricity, Engineering and Technology Division, Pasadena City College

William Fleming, Owner, Solar Design Workz

Tom King, Operations Manager, Phat Energy and Member of NABCEP

Solar Energy and Photovoltaics has become an extremely desirable energy solution for many diverse applications. This developing technology has opened doors for new and creative methods of design, installation and marketing venues. Working more with architects and artists, esthetically desirable and functional systems may be achieved.

"Off The Roof" concepts have the capability to provide artistically based designs as well as provide cost reduction when needed. This innovative approach enables property owners to utilize other areas of their real-estate to insure high quality installations. New product materials and technologies assist this new and creative "Off the roof top and down to earth" solution.

This Session will provide discussion on:

- Standard Design Techniques
- Creative Design Implementation
- Variation on design Parameters
- Application of the "Off the Roof Top Method"
- What make this concept desirable for both the consumer and the operator
- Applying this concept to residential, commercial, and industrial sites

Please join us for this exciting session that will present the advantage and benefits of innovative installation techniques of solar energy photovoltaic systems, "GO FOR SOLAR!"

T4**RA****PQ****CC**

Mitigating PQ Problems in Legacy Data Centers

Boris Ilinets, P.E., Electrical Engineer, SLAC National

Accelerator Laboratory

Legacy data centers are still affected by harmonics and other problems associated with power quality (PQ). To keep mission critical servers and data storages reliably operated the electrical engineers need to mitigate harmonics originated in non-linear loads.

Topics covered in this session include:

- IEEE 519 requirements
- Implementation of harmonic cancellation transformers
- Active harmonic filters
- New types of PF-corrected power supplies in IT equipment

Discussion will focus on harmonics mitigation methods.

T5**CC**

ROUNDTABLE: PacifiCorp Six-State ESR – Electric Service Requirements by PacifiCorp

Dirk Burton, CEO, Able Electric Co.

Does PacifiCorp have legal right to enforce? Are they going beyond the NEC? What to do to make changes in the ESR? How to get variances from PacifiCorp. What to do if PacifiCorp refused to connect to your service.

Program and Speakers Subject to Change. Check online for program updates.

Conference Program – Thursday, February 24



Ask the Experts

9:15 a.m. – 10:30 a.m.

Show Floor Theater

FREE to All Attendees

Moderator:

Sam Wheeler, Energy Consultant

See page 4 for full description.

Ask the Experts will cover the following Tracks:

BP CC DE LI MT
PQ RT RA SA

Concurrent Sessions
11:00 a.m. – 12:00 p.m.

T6

UPS & Generator Commissioning

John Johnson, CxA (Commissioning Agent), Worldwide Environmental Services, LLC

Every data center infrastructure component that we commission is equally critical. But the most challenging are usually the UPS's, generators and their associated switchgear.

Leave with key insights and tips on the following topics:

- On site versus Factory Witness testing
- What tests **MUST** be performed during commissioning?
- Determining "Pass/Fail" criteria
- How long should a Burn In last?
- Capturing data "real time" versus reviewing data after the fact
- Case studies and lessons learned

RA MT

T7

NFPA 70E - 2012 Changes

Dennis K. Neitzel, Director Emeritus, AVO Training Institute, Inc.

This presentation will address the expected revisions of the 2009 edition for the 2012 edition of NFPA 70E. Attendees will learn about the Proposals and Comments as acted on by the NFPA 70E Technical Committee.

The following will be addressed:

- Major anticipated revisions for NFPA 70E-2012 which will include, but will not be limited to:
 - ~ Explanations of the proposed DC Arc Flash Analysis
 - ~ New equipment labeling requirements
 - ~ Revised Hazard/Risk Category Tables

SA CC

T8

Is There a Connection Between Power Quality and Reliability?

Bob Schuerger, P.E., Principal Reliability Analysis Corporate Lead, HP Critical Facilities Services

This session will cover the interrelationship between Reliability and Power Quality. It will discuss how improving the Power Quality does not necessarily improve the Reliability and vice versa. It will give the attendee a better understanding of both and an understanding of the interrelationship.

You will leave this session with:

- An understanding of Reliability and its terminology
- An understanding of Power Quality and its terminology
- An understanding of the interrelationship between the two
- Common examples of how Power Quality interacts with Reliability

PQ

T9

Energy Industry Contracts for Non-Lawyers

Mark Safty, Chair, Energy & Infrastructure, Holland & Hart LLP

This session is designed to provide developers of energy projects, those working at electric utilities, and other non-legal professionals in the energy industry with an overview of the structure and mechanics of contracts commonly encountered in the industry. The session will highlight the legal framework and fundamental purpose of these documents for the non-lawyers who work with them, as well as break down and analyze key provisions, and help the participants gain familiarity and comfort with basic legal terminology and concepts. Participants will have an opportunity to read sample agreement provisions, identify drafting flaws, and discuss ways to address and resolve those issues. The session will provide the participants with a better understanding of the intricacies involved with drafting and interpreting various terms and conditions and will attempt to demystify some of the "legalese" or "boilerplate" provisions commonly found in contracts.

BP

T10

Energy Efficient Electrical Equipment and the Role of Copper

Richard deFay, Project Manager, Sustainable Electric Energy, Copper Development Association Inc.

How will you improve your facility motor efficiency and reduce electric consumption and energy cost? This session reviews the effectiveness of measures to improve motor efficiency in your operation as well as:

- Results of NYSERDA's Motor Audit Program
- Implications of corrective actions
- Review of a case study from NYCO Minerals in NYS
- Use of the DOE's MotorMaster+ software tool
- Repair replace decisions
- Technological advances of:
 - ~ The copper rotor motor ~ Permanent magnet motors
 - ~ Switched reluctance motors
- New EISA Legislation that took effect December 17, 2010
- Resources available to assist you

RA MT



Lunch n' Learn

12:00 p.m. – 1:30 p.m.

**Plug-In Electric Vehicles:
Getting PEV-Ready**

Dick Cromie, Program Manager - Advanced Technology, Southern California Edison Company

See page 5 for full description.

Separate Registration Required

Lunch n' Learn program will cover the following Tracks:

RT BP DE RA MT

Concurrent Sessions
2:00 p.m. – 3:00 p.m.

T11

Ground Testing: Matching Instrumentation & Techniques to Applications

Jeffrey R. Jowett, Applications Engineer, MEGGER®

Gain a fundamental understanding of ground resistance testing and how it is unique in electrical measurement.

Leave this session with knowledge and understanding on:

- How ground testers are designed and operated
- Why generic ohmmeters cannot and should not be substituted
- The significance of procedures when performing a ground resistance test

MT DE

T12

BP RA

Good Project Management: Improving the Bottom Line

John DeDad, Training Specialist, GE Energy - Industrial Solutions - Electrical Distribution

Managing an electrical construction project is a challenging task that requires knowledge of installation procedures and attention to detail. Successful project management results in improved profit margins.

This session will cover important project management topics such as:

- Material and labor scheduling
- Tooling
- Preparing cost breakdowns to keep ahead of retainage
- Reviewing estimated vs. actual labor and material costs

T13

PQ RA BP

How to Perform a Power Survey

Ross Ignali, Director of Product Management, Dranetz

Greg Evans, Chief Executive Officer, Welcomm, Inc.

Power monitoring can encompass everything from Energy surveys to Power Quality surveys or anything in between. Energy surveys typically look at energy consumption with the goal of understanding how much energy is used, when and where. Power quality surveys are focused on the compatibility of the power source to the load with the goal of troubleshooting problems or improving uptime. Each can be done on a proactive or reactive basis. Proactive monitoring is done to better understand and/or improve the process with the end goal being problem prevention, improved reliability or energy reduction. Reactive monitoring is troubleshooting, a problem occurred and you're trying to fix it.

This interactive session will review:

- The various types of power surveys
- Instrument wiring and configurations
- The steps necessary to best guarantee the desired data is collected

Actual case studies will be used to demonstrate the concepts presented.

T14

RA BP

What To Expect From an Estimating System

Paul Wheaton, National Sales Manager, McCormick Systems, Inc.

This session will cover all sizes of estimating systems for any size shop – small or large – even yours! The session will feature – how to break out the job so that you can manage the work, explore all the tools to help you take off the job quickly, accurately, and efficiently. Look at different options for updating your material prices and finding your different labor factors. Finally, find different ways to wrap up the bid and prepare for the job.

Learning objectives include:

- How to manage your jobs
- How to break up a job down into manageable areas for your estimating and also for your project management
- How to work efficiently and take off quickly
- Managing a database – prices, labor units, factors and checks and balances
- How to recap the job and check your material lists
- How to pull it all together to create a proposal

T15

RT

ROUNDTABLE: Green Careers

Bob Oedy, Sustainability Expert & Author of the Book

The Green Career Ladder: A Step-by-Step Guide to Profitable Careers in Sustainable Energy.

- Why Green is finally here to stay
 - Chart your own path to success
 - Build a Green-focused resume
 - Learn ideas to help you stay on-track
 - Position yourself for maximum growth with today's most innovative companies
- Discussion will focus on hidden opportunities.



**Concurrent Sessions
3:30 p.m. – 4:30 p.m.**

T16

SA CC DE

A Holistic Approach to Electrical Safety

Danny Liggett, Electrical Safety Competency Leader, Gulf West Region of the U.S., DuPont Company

This paper provides a brief history and summarizes key learnings derived from the Electrical Safety Workshops sponsored by the IAS since 1992. The learnings from this paper serve as a reference resource in organizing similar workshops, planning and implementing safety programs, developing training media, improving product safety design, and identifying improvement opportunities in development of standards and regulations.

Topics will cover:

- Mission of the Electrical Safety Workshop
- Learnings that can be used to make further electrical safety improvements
- The future of the Electrical Safety Workshop



T17

RA BP RT

Higher Voltage DC (HVDC) Power Solutions for Critical Power Environments

Elbert R. Baugh, P.E., Electrical Engineer, ABS, Inc.

EPRI & EPA approved future critical power supplies to be 400volt DC with dual bus distribution. FAA critical high reliability power supply has developed a major improvement. The modification eliminates 208/120 volt distribution, batteries, UPS units, transfer switches, PDU and transformer units.

This resulting new distribution has the following important new characteristics that prove why data centers should be using direct 400VDC:

- 7% facility energy saving, including cooling when compared to best-in-class AC system
- 7.7% at 50% load; 6.9% at 80% load
- Higher efficiency gains when compared to typical present day AC power topologies
- 33% space savings - no PDUs, simplified switchgear
- 200% Reliability improvement - 2x lower probability of failure in 5 years and 1000% reliability improvement if direct connect to flywheels
- 15% electrical facility capital cost savings – when electrical represents 40% of total cost
- Overall heat load reduction reduces overall cooling requirement

And finally, the added bonus of using fewer of the earth's resources, since you realize a 15% component volume reduction in every server power supply (PFC).

T18

PQ

A Case Study Roadmap to Preventing Power Quality Problems

David Brender, P.E., National Program Manager, Copper Development Association, Inc.

This session will explore the fundamental concepts of causes and suggested solutions to prevent power quality problems. We will examine harmonics, transients, and poor wiring and grounding that lead to downtime in your facility. Through actual case studies we will find what other facilities have done that is both practical and cost-effective in solving power problems.

- What are harmonics?
- Lightning and other transients, causes and cures
- Proper grounding and bonding
- Wiring suggestions beyond Code minimum

T19

**BP CC DE CC MT
PQ RT RA CC**

What's Wrong Here – Ripped from the Pages of EC&M

Joe Tedesco, NEC Consultant, Tedesco Electrical Code Consultants, Inc.

Round 2 of this popular session. Join Joe as he reviews all different examples of some of the worst electrical fire, shock, and safety hazards Joe has discovered that were published in the EC&M CodeWatch, Illustrated Catastrophes, and What's Wrong articles here since the beginning!

- Learn how to find some of the same hazards in your area
- See how you can identify the electrical code references that apply
- Learn how to recognize these types of hazards and work that was done by unqualified persons

See Example on page 14, near session description.

Conference Adjourns

Conference Leadership Provided by:

EC&M

*Program and Speakers Subject to Change.
Check online for program updates.*

Travel Information / Registration Options

Travel Information

Electric West has secured discounted hotel rates for Electric West participants at the Hyatt Regency Long Beach, this year's headquarters hotel.

\$149 single/double rate.

The hotel reservation deadline is February 2, 2011.

To make your travel reservations:

- Visit www.electricshow.com and click on the Travel tab
- Contact the Electric West Travel Desk at 1-800-359-9949
- Email electricshow@onpeakevents.com



Please Note: onPeak is the only official housing partner associated with Electric West. While other companies may contact you offering housing, they are not endorsed by or affiliated with Electric West.



Electric West has several registration options available, pick the option that best suits your needs!

All conference options include access to the Exhibit Hall, Keynote Address and Ask the Experts.

NEC Workshops

Get up to date on the latest changes from the code-authority himself – Mike Holt. Select one or register for both workshops and SAVE. Includes lunch coupon for day(s) selected.

- NEC1: Understanding Important NEC Requirements (Tuesday, February 22)
- NEC2: Grounding versus Bonding (Wednesday, February 23)
- NEC1 & NEC2: Combo package – **BEST VALUE**

PAC Workshops

These full- and half-day workshops allow you to immerse yourself in a topic of interest. Pay the one day price and select one from 3 full-day options or two from 6 half-day options. See workshop descriptions on pages 10-11. Includes lunch coupon for Tuesday, February 22.

Full Education Pass

Receive sessions, Hot Topics, Roundtables, and more. The Electric West Full Education Pass includes Wednesday – Thursday conference sessions, two days of exhibits, and admission to the Keynote Address and Ask the Experts Panel.

Register by January 21, 2011 and Save \$100 on the Full Education Pass!

Group Rates are also available – send 3-5 people and SAVE 15%; send 6+ people and SAVE 25%!

Visit www.electricshow.com for more information.

Education Day Pass

Have only one day to spend at Electric West? Select one of our 1-Day Conference Options and save \$70 if you register by January 21! Includes the entire conference program on your selected day, two days of exhibits, and admission to the Keynote Address and Ask the Experts Panel.

Lunch n' Learn

Whether you're attending the conference or only coming to visit the Exhibit Hall, plan to add an informational lunch about the future of Plug-In Electric Vehicles to your Electric West experience. Content and boxed lunch provided.

Exhibits Only Option

Don't have time for all the conference sessions but want to check out the latest products and services the industry has to offer? Register by February 21, 2011 and your Exhibits Only admission is FREE!

NEW FOR 2011

Government and Student Rates for Full Education Pass Option

To qualify for either the student or government rates you must provide appropriate ID from accepted institutions/organizations or you will be charged the regular Full Conference Rates.

- Students can use the attached form to register or register online.
- Government Employees can request a Government Registration Form by emailing electricwest@compusystems.com.

REGISTRATION IS EASY!

Go to the registration page of www.electricshow.com or use the registration form on the back of this brochure. Be sure to register by **January 21, 2011** to take advantage of our special registration discounts!

Featured Exhibitors & Industry Support

We are proud to have these industry leaders among the exhibitors and partners at Electric West.



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THE WEEK

Conference: February 22-24, 2011 • Long Beach Convention Center • Long Beach, CA
Professional Advancement Courses: February 22, 2011 • Exhibit Hall: February 23-24, 2011

Four Ways to Register:
 1. Online: www.electricshow.com
 2. Fax: 708-344-4444
 3. Phone: 800-927-5007 • Int.: 708-486-0727
 4. Mail: Electric West – c/o CSI
 P.O. Box #624, Brookfield, IL 60513-0624

Please don't register via more than one method and risk duplicate billing. Please complete all questions, incomplete forms cannot be processed. Photography and filming is prohibited in the exhibit hall. **Must be 18 to attend.**

1. General Information. Please complete the below information.

FIRST NAME _____
 LAST NAME _____
 TITLE _____
 COMPANY _____
 STREET ADDRESS _____
 CITY _____ STATE _____ ZIP/POSTAL CODE _____
 COUNTRY (OUTSIDE THE U.S.) _____
 PHONE _____ FAX _____
 CELL PHONE* _____ EMAIL** _____

* By providing my cell number, I am giving the Electric West Show and its exhibitors/sponsors permission to contact me via cell or text regarding registration, emergency situations, updates and promotional materials.

** By providing my email address, I grant Penton Media permission to contact me via email regarding my Electric West registration, event updates, and promotions from Electric West Exhibitors and associated Penton Media publications.



Please contact me about special needs.

2. Your Profile

1. Your Title or Job Function (Check ONE only)

- | | |
|---|--|
| <input type="checkbox"/> A Electrical Engineer | <input type="checkbox"/> K Design Engineer |
| <input type="checkbox"/> B Chief Electrician | <input type="checkbox"/> L Sales Engineer |
| <input type="checkbox"/> C Electrician | <input type="checkbox"/> M Electrical Supervisor |
| <input type="checkbox"/> D Electrical Contractor | <input type="checkbox"/> N Maintenance Engineer |
| <input type="checkbox"/> E Estimator | <input type="checkbox"/> O Cable Installer |
| <input type="checkbox"/> F Project Director | <input type="checkbox"/> P Network Installer |
| <input type="checkbox"/> G Facilities Manager | <input type="checkbox"/> Q Sales/Marketing |
| <input type="checkbox"/> H Electrical Inspector | <input type="checkbox"/> R Manufacturer's Rep. |
| <input type="checkbox"/> I Plant Engineer/Other Plant Personnel | <input type="checkbox"/> S Purchasing |
| <input type="checkbox"/> J President, Owner, Partner, Officer | <input type="checkbox"/> T Other |

2. Your Industry Group (Check ONE only)

- | | |
|--|--|
| <input type="checkbox"/> A Electrical Contracting | <input type="checkbox"/> I Government |
| <input type="checkbox"/> B Electric Utility | <input type="checkbox"/> J Data/Telecom |
| <input type="checkbox"/> C Consulting/Architectural Engineering Firm | <input type="checkbox"/> K Repair & Service |
| <input type="checkbox"/> D Healthcare Facility | <input type="checkbox"/> L Manufacturer's Agent |
| <input type="checkbox"/> E Commercial Building | <input type="checkbox"/> M Wholesaling |
| <input type="checkbox"/> F Transportation | <input type="checkbox"/> N Banking/Finance |
| <input type="checkbox"/> G Manufacturing | <input type="checkbox"/> O ESCO (Energy Service Company) |
| <input type="checkbox"/> H Institutional | <input type="checkbox"/> P Oil & Gas; Mining |
| | <input type="checkbox"/> Q Other |

3. Purchasing Influence (Check ONE only)

- A Final Say B Recommend C Specify D Other

4. Company's Estimated Annual Equipment/ Services Expenditures – That You Influence (Check ONE only)

- | | |
|--|--|
| <input type="checkbox"/> A Less than \$249,999 | <input type="checkbox"/> D \$1,000,000 - \$1,999,999 |
| <input type="checkbox"/> B \$250,000 - \$499,999 | <input type="checkbox"/> E \$2,000,000 - \$4,999,999 |
| <input type="checkbox"/> C \$500,000 - \$999,999 | <input type="checkbox"/> F \$5,000,000 or more |

5. How many people are in your entire company or organization (in all locations)?

- | | |
|------------------------------------|----------------------------------|
| <input type="checkbox"/> A 500+ | <input type="checkbox"/> E 20-49 |
| <input type="checkbox"/> B 250-499 | <input type="checkbox"/> F 10-19 |
| <input type="checkbox"/> C 100-249 | <input type="checkbox"/> G 5-9 |
| <input type="checkbox"/> D 50-99 | <input type="checkbox"/> H 1-4 |

6. Do you wish to Receive/Continue to Receive EC&M FREE?

- A Yes B No

(Signature required)

Date

7. How would you like to receive your copy of EC&M?

- A Digital B Print

4. Method of Payment

Registrations will not be processed without payment or if made with declined or invalid credit cards.

Check# _____ enclosed (Make payable to Electric West)

Credit Card (check one): American Express MasterCard VISA

CARD NO. _____ EXP. DATE _____

CARDHOLDER NAME (PRINT) _____

SIGNATURE (REQUIRED) _____

Cancellation Policy:

Electric West recognizes that both professional and personal situations can result in needing to make a change to business travel. Therefore, if your plans change, substitutions are always welcome in lieu of cancellations. Requests for refunds must be made before 1/21/2011 by Email: electricwest@compustystems.com or Fax: 708-344-4444. Approved refunds will be processed within 2-weeks less a \$75 cancellation fee. Refunds will not be issued for no-show registrants. Please note the program is subject to date including cancellations and scheduling. Please refer to www.electricshow.com for the most up-to-date information about Electric West.

3. Registration Options

All conference options include access to the Exhibit Hall. Keynote and Ask the Experts are FREE to all attendees.

1. NEC Workshops (NECs run 8:30-5:00 each day; includes lunch coupon.)

- | | | |
|--|------------------|---------------------|
| <input type="checkbox"/> NEC1 (Tuesday, February 22) | By Jan. 21 \$435 | After Jan. 21 \$480 |
| <input type="checkbox"/> NEC2 (Wednesday, February 23) | \$435 | \$480 |
| <input type="checkbox"/> NEC1 & NEC2 Combo | \$825 | \$960 |

2. PAC Workshops

(Tuesday, February 22 - includes lunch coupon) \$435 \$480

Select 1 full-day or 2 half-day options from the listing below:

Full Day Workshops:

- 8:30-5:30 PAC1 - Surge Protective Devices - Facility Coverage
- 8:30-5:30 PAC2 - IAEI Analysis of 2011 Code Changes
- 8:30-5:30 PAC3 - IAEI Photovoltaic Systems

Half Day Workshops:

- 8:30-12:30 PAC4 - Smart Grid: If You Don't Know Where You are Going, ANY Road Will Get You There!
- 8:30-12:30 PAC5 - NFPA 70E - 2012 Electrical Safety Requirements
- 8:30-12:30 PAC8 - Retrofitting Lighting and Controls - Best Strategies, Rebates and Tax Breaks
- 1:30-5:30 PAC6 - Essential Elements of Electrical Estimating
- 1:30-5:30 PAC7 - Training Electricians for the Energy Future
- 1:30-5:30 PAC9 - Latest Lighting Energy Code Updates: California Title 24 2008 - ASHRAE-IES 2010 - IECC 2009 Lighting

Group rates are available - Visit website www.electricshow.com for details.

3. Full Education Pass \$650 \$750
 (Includes Wed-Thu conference sessions only; does NOT include NEC, PAC workshops, or Lunch-n-Learn. You must sign up for Roundtables onsite at the event.)

4. Student Education Pass \$400 \$500
 (To qualify for the student rate, please include a copy of a valid college student ID from a recognized educational institution or you will be charged the regular Full Conference Rate.)

Student ID Number: _____ Institution: _____

5. Education Day Pass \$420 \$490
 (Includes Wed OR Thu conference sessions only; does NOT include NEC, PAC workshops, or Lunch-n-Learn) Wednesday Thursday

6. Lunch n' Learn 12:00 - 1:30 \$50 \$55
 (lunch from 12:00-12:25)
Plug-In Electric Vehicles: Getting PEV-Ready
 (Includes Exhibit Hall)

7. Exhibit Hall Only FREE with this form **\$55 Onsite**

Total Registration Fees \$ _____ \$ _____

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