

Understand the Smart Grid and how it's likely to evolve and be protected.

Course Date & Location

When: March 30-31, 2010
Day 1: 8:00 a.m. – 4:00 p.m.
Day 2: 8:00 a.m. – 12:00 p.m.

Where: Regus Conference Center
1200 Smith Street 12th Fl
Houston, TX 77002

What You Will Learn

This course will show both the liabilities and options of the electric Smart Grid, which can vary dramatically from one geographic area to another. In its contemporary form, the Smart Grid encompasses the facilities, control systems and protocols from the electric generators to the retail customers and their usage patterns. The new Smart Grid will be a target for foreign governments, terrorists, hackers, and disgruntled employees that may be intent on causing damage to the U.S. electric grid and utility system integrity. The Smart Grid will also offer a wealth of benefits in energy conservation, control of electric generation, and transmission of energy to best meet customers needs economically and dependably. This course will explore the Smart grid vulnerabilities and implementation options that may best protect and utilize new technologies, with a focus on best practices around the country.

This highly interactive and intensive day and a half program will focus on two areas:

1. Smart Grid Options

Attendees will gain an understanding of best practices to enhance energy conservation, control and plan electric generation, and transmit electricity from lowest cost and environmentally acceptable electric generation sources to serve dynamic, critical electric loads.

2. Grid Vulnerabilities

Attendees will gain an understanding of what vulnerabilities exist in the electric grid today and how the Smart Grid will expand risks. You will see the progression of liabilities with Smart Grid employment and means to protect the system against external unwanted influences. You will see the critical infrastructure and how it has evolved into the Smart Grid with increased risks to society from cyber threats to

The Smart Grid 101 class will provide attendees with a comprehensive understanding and knowledge base about the Smart Grid and how it is likely to evolve and be protected. EMI's unique program delves into the details of the development of the Smart Grid and operation, with useful examples of best implementation practices.

Finally the program will end with a very exciting, simulated exercise to show groups of attendees how to look at a sample utility system and assess needs for improvement, including system protection.

Subjects covered include:

- Electric grid operation and evolution to the Smart Grid, including electric system design and operation, technical and tariff changes ahead, and integration between utilities and Regional Transmission Organizations.
- Smart Grid components, including metering, demand response, virtual power plants, dynamic pricing, grid enhancement funding, demand analysis, promotion of "green" resources, governmental regulation, network standards, network integration, loan guarantees, consumer privacy and how all parties benefit the grid operation in supply reliability and economy.
- Risks to the Smart Grid and protective measures to ensure system integrity and supply reliability.
- Simulated exercise to apply materials learned to a Case Study to collectively discuss best practices and grid protection that may apply.

Program Registration Fees

1st delegate: \$1,895
2nd delegate: \$1,695
3rd delegate: \$1,500

Fee includes full course, expert instruction, course materials, continental breakfast, & lunch.



Smart Grid 101

March 30-31, 2010 ~ Houston, TX ~ An EMI Energy Training Program

Who Should Attend

This course is specifically designed for people working in:

- Electric Utility Transmission Design
- Electric Utility Operations
- Electric Utility Tariff Development
- State and Federal Regulators of Electric Utilities and Transmission Grids
- Demand Response
- Smart Grid Infrastructure Development (communications, metering, and planning)
- Strategic Planning
- Electric Risk Management
- Energy Procurement

CPE Credits



This course earns 10 CPE credits. EMI awards credit hours towards CPE and Certified Purchasing Manager status (CPM).

Course Syllabus

Day 1 (8:00 a.m. - 4:00 p.m.)

▣ Session 1 - Overview of the U.S. Electric Grid System

Let's set the stage by addressing the topic. How is the current electric grid designed, regulated and operated to manage electric generation resources, transmit electricity, and anticipate and manage customers' needs? How are electric generation sources selected? How is the cost and availability of electric generation resources used to meet anticipated customers needs? How does demand response work today and how is cost allocated among customer classes? How secure is today's electric grid and what regulations apply? We will delve into planning and operation of today's grid, which is far more comprehensive than just wires between generation resources and customers.

▣ Session 2 - New Smart Grid Technologies

This session will delve into Smart Grid components, including metering, demand response, virtual power plants, dynamic pricing, grid enhancement funding, demand analysis, promotion of "green" resources, governmental regulation, network standards, network integration, loan guarantees, and consumer privacy and how each has evolved to be a critical part of the Smart Grid development. We will explore all major components of the Smart Grid, including regulators, utilities, customers and potential suppliers. This will be a no-nonsense, non commercial "primer" with detailed options and implementation methods.

▣ Session 3 - Examples of Smart Grid Applications

This session will highlight development practices, principles, and measureable results of Smart Grid applications worldwide. Public case studies will be discussed with potential benefits to other utilities, customers, and potential suppliers. Expectations are that the utility grid will be completely reformed, just as cell phone technology replaced the rotary dial and stationary communication.

Course Syllabus

Day 2 (8:00 a.m. – 12:00 p.m.)

▣ Session 1 – Vulnerabilities of the Smart Grid

This session will delve into the definition of critical infrastructure, the need for infrastructure protection, common control of system vulnerabilities, issues in remedying vulnerabilities, governmental efforts to protect the grid, and industry efforts to protect the Smart Grid.

▣ Session 2 – Simulated Exercise

Groups of attendees will be provided with distinct “Case Studies” to analyze opportunities for improvement in Smart Grid applications and security and to report to the full class their case analysis and recommendations for improvement. Emphasis will be on teamwork, application of class materials, and professional experience in their field of expertise.

Learn from the Best!

Don't miss this chance to learn from 30 years of electric system design and operations experience in regulated and deregulated markets with industry expert Mr. Jackson Mueller. Mr. Mueller has worked in the comprehensive energy industry on behalf of utilities and customers, with an active role in governmental regulatory development, and development and communication of best prices to enhance the values of energy services to suppliers and customers. Truly an experienced and respected senior analyst, Mr. Mueller has developed innovative and successful energy strategies that you can learn first-hand and put to use in your immediate and long term energy career.



About EMI Instructors



Learn From the Experts that Experts Trust

EMI experts are frequent editorial contributors to petroleum magazines & are trusted by today's leading news sources. Our experts have been featured in:

Futures Magazine • *The Wall Street Journal* • *USA Today* • *The New York Times* • *The Washington Post* • *Journal of Commerce* • CNN • NBC • CBS • ABC • Bloomberg • Reuters

EMI's industry experts have provided risk and value management analysis, advice, information, and services to a variety of companies in the electric power industry. Clients have included power marketers, integrated utilities, retail power providers, hedge funds, and power plants.

EMI's leading industry experts have an average of over 30 years of knowledge and experience in:

**Energy • Commodity trading • Risk management
• Education • Consulting • Financial services**

Plus many years of managing marketing, international trading, manufacturing, consulting, start-up operations and project finance operations of well-known companies; integrated major oil companies as well as international trading companies.

Highlights of our instructors' experience include: • Developing a suite of models for a variety of power markets that quantify value and risk • Managing spark spread portfolios for hedge funds in the power markets • Operating in futures trading pits as a market observer in the power markets • Developing working papers for investigations and performing compliance audits in the power industry • Helping Texaco initiate its first use of futures exchanges as an integral part of hedging/trading strategy • Chief Operating Officer of Triwell Marketing and refining • Director of OPIS, Oil Price Information Service, a management-consulting and educational services group that solely focused on the downstream energy industry • Member of Board of Directors of Longview Refinery • Member of the New York Mercantile Exchange Petroleum Advisory Board • Expert witness for a hearing before the subcommittee on surface transportation for the Commerce, Science, and Transportation Committee of the US Senate • Supplied expert testimony to a US Senate subcommittee hearing on diesel petroleum product pricing • Supplied testimony to the Federal Highway Administration regarding fuel tax evasion • Expert witness in a MTBE litigation against the major oil companies • Publishers of *The Daily Hedger*, *BTU's Daily Gas Wire* and *BTU's Daily Power Report*, which advise thousands of petroleum professionals daily.

Our instructors are **frequent expert speakers for numerous petroleum industry events and trade associations including:**

- DOE DESC World Energy Conference • OPIS Fleet Fueling • NYMEX • Fuel Management University • NATSO • ATA • AAA • Dairy Distribution • eyeforEnergy eCommerce • OPIS Supply Summit • CIOMA • American Society of Mechanical Engineers • American Society of Lubricating Engineers • Ambrust Aviation • NACHA.

Over the years EMI has developed a series of intensive courses covering all aspects of Energy from production all the way to managing the impact price and volatility on the margin of end-users, resellers, traders, marketers, shippers, retailers and refiners. Our instructors have had the privilege to instruct thousands of professionals representing all aspects of the energy industry, including every major oil company (i.e. Exxon Mobil, BP, Shell, Equilon, Motiva) major power utilities (i.e. Sempra, Edison Mission, Berkley, Toronto Hydro, Dominion, Conectiv) small marketers (i.e. Sprague, Getty, Southern Counties, Western Petroleum) trucking fleets from 50 to 10,000 (i.e. UPS, U.S. Postal Service, Yellow, Pepsi, Werner), gasoline-powered fleets hyper-markets (i.e. The Pantry, Wawa, BJs Wholesale) and many fortune 500 energy consumers.



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Reserve Your Seat Today!

Three easy ways to register:

1. Call PMA Conference Management at 201.871.0474 or send email to: register@pmaconference.com.
2. Complete & fax this form to 253.663.7224.
3. Complete & mail the form to: PMA Conference Management, POB 2303, Falls Church, VA 22042.

<p>A Registration Fees:</p> <p>\$1,895 for full two-day program</p> <p>This fee includes expert instruction, course materials & lunch.</p>	<p>Discount for Additional Attendees:</p> <p>2nd delegate \$1,695</p> <p>3rd delegate \$1,500</p>
<p>B Enrollment Information (please print clearly)</p> <p>NAME: _____</p> <p>COMPANY: _____</p> <p>ADDRESS: _____</p> <p>_____</p> <p>PHONE: _____ FAX: _____</p> <p>E-MAIL: _____</p>	
<p>C PAYMENT METHOD</p> <p><input type="checkbox"/> Please invoice my company (payment must be received prior to course date)</p> <p><input type="checkbox"/> MasterCard <input type="checkbox"/> Visa <input type="checkbox"/> American Express</p> <p>Card Number _____ Expiration Date ____/____/____</p> <p>Card Holder Name _____</p> <p>Card Holder Signature _____</p>	

REFUND/CANCELLATION POLICY:
Attendees may reschedule for a different date or course with no penalty. 100% refundable with 14 days cancellation notice. 80% refundable with 5 days cancellation notice. Cancellations are non-refundable day of or after course.
