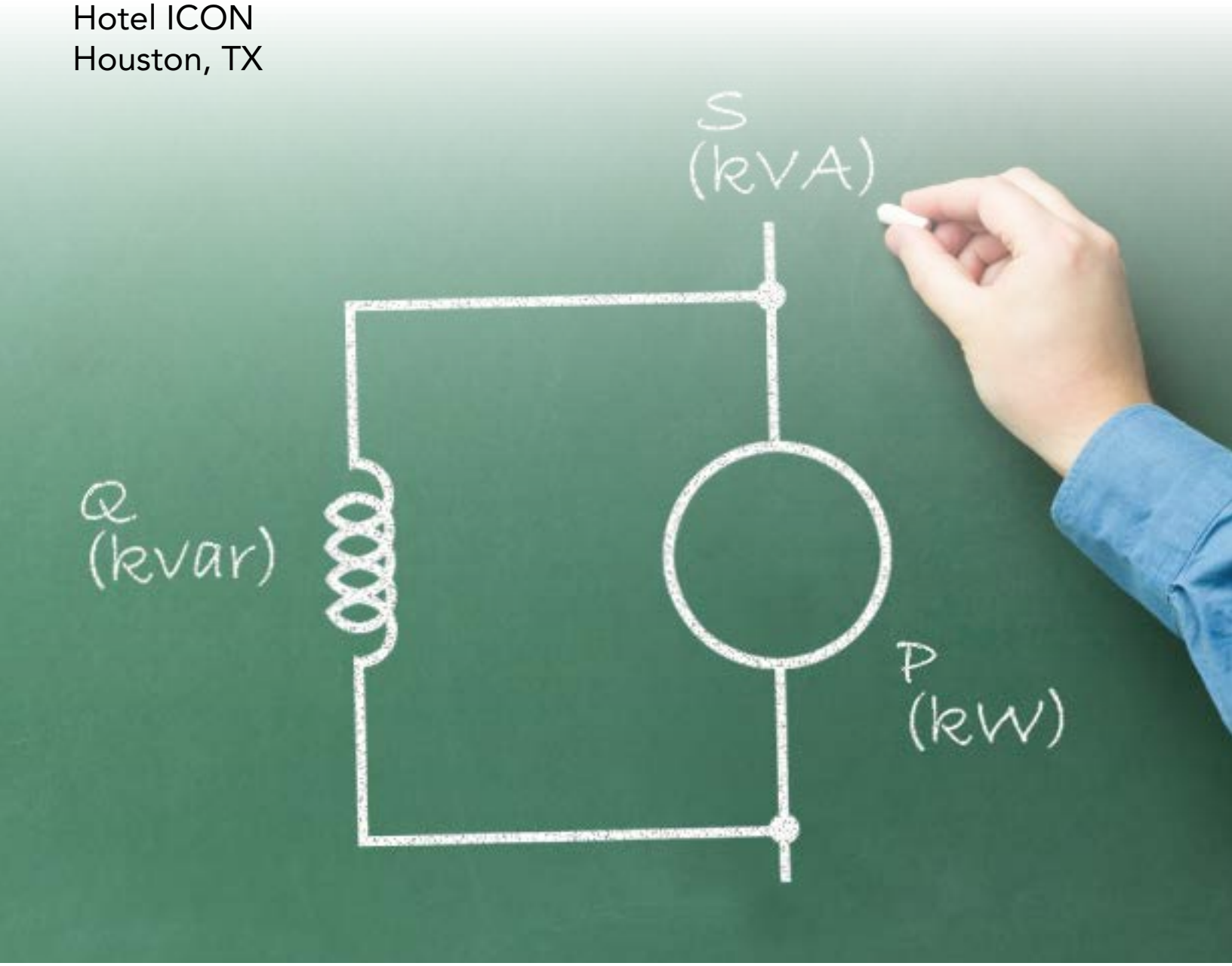
EUCI COURSE

REACTIVE POWER, VOLTAGE STABILITY, AND CONTROL

January 29-30, 2015
Hotel ICON
Houston, TX



EUCI is authorized by IACET to offer 1.0 CEUs for the course.

OVERVIEW

In today's power grid, reactive power causes more blackouts than poor damping and energy instability combined. Reactive power problems are more severe for heavily loaded transmission systems and when equipment with high demands for reactive power, such as wind turbines and arc furnaces, are utilized. The cyclic nature of reactive power in some equipment adds more challenges for utility engineers when classic solutions cannot effectively address the problem.

This course is designed to cover the concept of reactive power, its impact on system losses and grid voltage, the concept of voltage collapse, the planning of reactive power, the cyclic problem of reactive power, and classic and advanced methods for compensating for reactive power in utility systems.

WHO SHOULD ATTEND

- Utility technicians and engineers
- Field technicians and engineers
- Manufacturing technicians and engineers
- System operators
- Maintenance crew and engineers
- Energy producers technicians and engineers
- Consultants and researchers in conventional and renewable energy

LEARNING OUTCOMES

- Concepts of AC systems
- Real and reactive powers
- Power factor of loads
- Consumption and production of reactive power
- The link between reactive power and system voltage
- Voltage collapse
- The impact of reactive power on utility grids and loads
- The cyclic reactive power and voltage flickers
- Methods to compensate for system reactive power and improvement of power factor
- Regulations and compliances

> ***Dr. El-Sharkawi presents voltage stability issues and control in an easy-to-understand for engineers and utility professionals. He successfully marries the mathematics with practical applications well."***
>
> Electrical Engineer, BPA

> ***This course will teach you an in-depth understanding of reactive power and how it has been controlled."***
>
> – Principal Engineer, PacifiCorp

AGENDA

Thursday, January 29, 2015

8:00 – 8:30 a.m. **Registration and Continental Breakfast**

8:30 a.m. – 5:00 p.m. **Course Timing**

12:00 – 1:00 p.m. **Group Luncheon**

AC systems

Real and reactive powers

Power factor

Inductive and capacitive loads

Voltage problems associated with excessive reactive powers (poor power factor)

Impact of reactive power on utility grids and loads

- Transmission losses
- Voltage deviation
- Voltage collapse

The cyclic reactive power and voltage flickers

- Industrial loads
- Renewable energy systems

Reactive power production at power plants

Reactive power control at power plants

Friday, January 30, 2015

8:00 – 8:30 a.m. **Continental Breakfast**

8:30 a.m. – 12:00 p.m. **Course Timing**

Reactive power control at the grid

- Fixed reactive power compensations
- Adaptive reactive power compensation (STATCOM, SVC, etc.)
- Synchronous condenser
- FACTS

Regulations of voltage and power factor

> ***"Material was presented in a way that can be understood by many levels of knowledge in the electrical field."***
>
> – Special Tester,
> Portland General Electric

INSTRUCTOR

Mohamed A. El-Sharkawi / Fellow / IEEE

Mohamed A. El-Sharkawi received his Ph.D. in electrical engineering from the University of British Columbia in 1980. That same year, he became a faculty member at the University of Washington, where he is presently a professor of electrical engineering. He has also served as associate chair and as chairman of the Office of Graduate Studies and Research.

During the past 30 years, Mohamed has taught courses on power systems, electric safety, transmission lines, electromagnetic transients, electric drives, and power electronics. He has organized and chaired numerous conferences, panels, and special sessions in IEEE and other professional organizations. He has published over 200 papers and book chapters in his research areas and holds five licensed patents. He has authored three textbooks, *Fundamentals of Electric Drives, Electric Safety: Practice and standards*, and *Electric Energy: An Introduction.*

INSTRUCTIONAL METHODS

The instructors will use PowerPoint presentations, group discussions and classroom exercises for course instruction.

REQUIREMENTS FOR SUCCESSFUL COMPLETION OF PROGRAM

Participants must sign in/out each day, be in attendance for the entirety of the course to be eligible for IACET continuing education credit.

IACET CREDITS

EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

EUCI is authorized by IACET to offer 1.0 CEUs for the course.

EVENT LOCATION

A room block has been reserved at the Hotel ICON, 220 Main St., Houston, TX 77002, for the nights of January 25-26, 2015. Room rates are $209, plus applicable tax. Call 1-713-224-4266 for reservations and mention the EUCI course to get the group rate. The cutoff date to receive the group rate is January 9, 2015, but as there are a limited number of rooms available at this rate, the room block may close sooner. **Please make your reservations early.**

REGISTER 3 SEND 4TH FREE

Any organization wishing to send multiple attendees to these conferences may send 1 FREE for every 3 delegates registered. Please note that all registrations must be made at the same time to qualify.

PROCEEDINGS

The proceedings of the course will be published, and one copy will be distributed to each registrant at the course.

REGISTRATION INFORMATION

Mail Directly To:
Electric Utility Consultants, Inc. (EUCI)
4601 DTC Blvd., Ste. 800
Denver, CO 80237

WWW.EUCI.COM
P: 303-770-8800
F: 303-741-0849

PLEASE REGISTER THE FOLLOWING

☐ **REACTIVE POWER, VOLTAGE STABILITY, AND CONTROL**
JANUARY 29-30, 2015: US $1395
EARLY BIRD ON OR BEFORE JANUARY 16, 2015: US $1195

EVENT LOCATION

A room block has been reserved at the Hotel ICON, 220 Main St., Houston, TX 77002, for the nights of January 25-26, 2015. Room rates are $209, plus applicable tax. Call 1-713-224-4266 for reservations and mention the EUCI course to get the group rate. The cutoff date to receive the group rate is January 9, 2015, but as there are a limited number of rooms available at this rate, the room block may close sooner. **Please make your reservations early.**

ENERGIZE WEEKLY

EUCI's Energize Weekly e-mail newsletter compiles and reports on the latest news and trends in the energy industry. Newsletter recipients also receive a different, complimentary conference presentation every week on a relevant industry topic. The presentations are selected from a massive library of more than 1,000 current presentations that EUCI has gathered during its 26 years organizing conferences.

☐ Sign me up for ***Energize Weekly.***

How did you hear about this event? (direct e-mail, colleague, speaker(s), etc.)

Print Name | Job Title

Company

What name do you prefer on your name badge? | Address

City | State/Province | Zip/Postal Code | Country

Telephone | Email

List any dietary or accessibility needs here

CREDIT CARD

Name on Card | Account Number

Billing Address | Billing City | Billing State

Billing Zip Code/Postal Code | Exp. Date | Security Code (last 3 digits on the back of Visa and MC or 4 digits on front of AmEx)

OR Enclosed is a check for $ _____ to cover _____ registrations.

All cancellations received on or before December 26, 2014, will be subject to a US $195 processing fee. Written cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCI event or publication. This credit will be good for six months. In case of event cancellation, EUCI's liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, please contact our offices at 303-770-8800.
EUCI reserves the right to alter this program without prior notice.