ELECTRIC UTILITY BASICS: GENERATION, DELIVERY, OPERATIONS, REGULATION, AND ECONOMICS

July 19-20, 2016
Embassy Suites Alexandria – Old Town
Washington DC Area
OVERVIEW

This training program is intended for persons working in, dealing with, or having special interest in the electric utility industry. It covers material on basic concepts, terms, and integration of functions in electric power systems. The primary functions of generation, transmission and distribution, planning concepts, operations and maintenance, regulation, rates, and economics will be addressed. The course will identify challenges, opportunities, and uncertainties that the electric industry faces in the energy market and evolving regulatory environment.

The course is designed so that anyone who is not familiar with utilities and electric power systems can benefit from the content. The course material will be a useful resource for future reference. The program is designed to stimulate dialog between the attendees and the instructor. A prior background in electric power systems or engineering is not required.

The following key topics will be covered:

• Purpose and goals
• Introduction: energy utilization and losses
• History of the U.S. electric industry and regulation
• Utility ownership models: IOUs, cooperatives, and public utilities
• Trends in consumption, prices, environmental considerations and economic growth
• Basic electricity concepts: watts, VARs, volts, and amps
• Utilization: loads
• Generation: terminology, sources, operations and economics
• Fuel sources and fuel diversity
• Renewable energy: wind and solar status and economics
• Energy storage, energy efficiency, and demand management
• Decoupling: rates to promote Energy Efficiency and Demand Management
• Power delivery system: transmission and distribution
• Meters and smart meters
• Measuring reliability
• System integration, reliability, and markets
• Regulatory and management agencies
• Utility types and ratemaking (price regulation)

WHO SHOULD ATTEND

Anyone interested in understanding the electric power industry will benefit from this content.

LEARNING OUTCOMES

• Discuss the basic concepts and equipment used in electric power and energy systems
• Identify sources of electricity generation and discuss their operations
• Describe terms, components, and functions of transmission and distribution systems
• Interpret load characteristics and demand and load modeling
• Identify and describe the various agencies responsible for electricity systems reliability, operations, and control
• Recognize the roles of electricity management and regulatory entities
• Analyze system integration challenges including structure, function, and operations
• Review energy economic functions and terminology and discuss the elements associated with determining revenues, costs, and rates
• Identify challenges and opportunities for utilities in the future
AGENDA

Tuesday, July 19, 2016

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

Introduction
Purpose and Goals of the Course

Energy – An Overview
• U.S. energy sources and uses
• Energy conversions
• Electricity measures
• Electric utility model

History of the U.S. Electricity Industry
• Early years and formation
• Monopoly abuses leading to regulation
• America electrifies – farms lag, REC formed
• Costs rise, regulations expand
• Retail competition begins
• Open access, SMD, and EPAC
• Wholesale markets evolution
• More recent developments

U.S. Electricity Industry Today
• IOUs, RECs, and government utility sectors
• Capital expenditures, past, present, future
• Economic growth and electricity use
• Use increases, emissions decrease
• Rates rise, real prices stay low
• Home use leveling off
• Outlook – higher demands and higher prices
• Basic electricity concepts AC and DC
• Voltage, current, impedance
• Basic power relationships and equations
• Real and reactive power and power factor
  o Leading and lagging reactive power
  o Correcting poor power factor
• Single-phase and three-phase power systems

“I am a new employee in the utility field with no background in electricity and utility districts. The seminar was a great overview of the history and basics of electricity generation, distribution, and regulations.”

— Engineer Technician, Modesto Irrigation District

“This was a great course for someone new to the electric side of the utility business.”

— Project Manager, Entergy

“A career’s worth of knowledge in 2 days.”

— Financial Analyst, Intren, Inc.
AGENDA

Tuesday, July 19, 2016 (Continued)

Generation (Energy Conversion)
- Terminology
- Production by fuel type
- Construction by fuel type and year
- Costs to build by fuel type
- Base, peak, intermediate
- How the different technologies work
  - Coal, nuclear, natural gas-fired, hydro, wind and solar
- Fuel diversity by region
- Carbon content of different fuels
- Trends affecting fuel diversity

Renewable Energy Overview
- U.S. wind energy potential and capacity
- U.S. solar energy potential and capacity
- Renewable energy tariffs and portfolio standards
  - Installation subsidies and REC purchase programs
  - Wind and solar economics (Ohio, Oahu, Oregon)
- RPS goals
- Electric energy storage
- Energy efficiency and peak demand reduction
- Decoupling – mitigating utility disincentives for EE and PDR

Wednesday, July 20, 2016

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

Transmission and Distribution
- Transmission and distribution are functions not voltages
- More transmission needed to create a national grid
  - Higher voltages mean fewer lines
- Distribution
- Meters and smart meters
  - Meters for large loads and high voltage
  - Service reliability indices - SAIDI, SAIFI, CAIDI, etc.
AGENDA

Wednesday, July 20, 2016 (CONTINUED)

Energy Utilization: Loads
- Residential, commercial, and industrial
- Base load, shoulder, and off-peak load
- Composite load – diversity

System Integration and Markets
- Reliability standards
- Terminology
- Control area operations
- Ancillary services
- Scheduling, dispatch, voltage and frequency regulation, energy imbalance, operating reserves, and black start service
- Economic dispatch
- Congestion management
- FERC and other regulatory agencies
- RTOs and ISOs
- NERC and regional reliability authorities

Wholesale Electricity Markets

Utility Business Models and Ratemaking (Regulated Pricing)

INSTRUCTOR

David Haley / Power Division Supervisor III / Tacoma Power

David Haley began working with electrical power systems in 1991 and has worked in the electric utility industry for the past 16 years. He currently serves on the management team for the Transmission & Distribution section of Tacoma Power. Dave has experience working with generation, transmission, distribution, system operations, asset management, customer service, and system planning. This experience has given him a variety of perspectives on the business of energy distribution, and a comprehensive knowledge of power system operations, design, and planning, as well as regulatory compliance issues. His experience as an instructor and trainer over the past ten years has helped him develop a teaching style that captivates audiences while breaking down complex subjects into easily understood explanations.

Wonderful Course for anyone new to the industry and who is looking to gain a foundation in utility processes.”

— Analyst, Southern California Edison
INSTRUCTIONAL METHODS

PowerPoint presentations and classroom discussion will be used for all learning outcomes in this course.

PROCEEDINGS

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

REQUIREMENTS FOR SUCCESSFUL COMPLETION OF PROGRAM

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

CREDITS

EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, the (organization name) 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 1.1 CEUs for the course.

EUCI is registered with the National Association of State Boards of Accountancy (NASBA) as a sponsor of continuing professional education on the National Registry of CPE Sponsors. State boards of accountancy have final authority on the acceptance of individual courses for CPE credit. Complaints regarding registered sponsors may be submitted to the National Registry of CPE Sponsors through its website: www.learningmarket.org.

Upon successful completion of this event, program participants interested in receiving CPE credits will receive a certificate of completion. EUCI is authorized by CPE to offer 13 credits for this program.

Program Level - Beginner
Delivery Method: Group-Live
Advanced Preparation: None

EVENT LOCATION

A room block has been reserved at the Embassy Suites Alexandria – Old Town, 1900 Diagonal Rd, Alexandria, VA 22314, for the nights of July 18-20, 2016. Room rates are $177, plus applicable tax. Call 1-703-684-5900 for reservations and mention the EUCI program to get the group rate. The cutoff date to receive the group rate is June 18, 2016, 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.
### PLEASE REGISTER THE FOLLOWING

- **REDUCED PRICE FOR ATTENDING BOTH ELECTRIC UTILITY BASICS AND ELECTRIC SYSTEM OPERATIONS 101, JULY 19-21, 2016, US $2195, EARLY BIRD ON OR BEFORE JULY 1, 2016: US $1995**

- **ELECTRIC UTILITY BASICS: GENERATION, DELIVERY, OPERATIONS, REGULATION, AND ECONOMICS COURSE ONLY, JULY 19-20, 2016: US $1395 EARLY BIRD ON OR BEFORE JULY 1, 2016: US $1195**

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

### Substitutions & Cancellations

Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before June 17, 2016 in order to be refunded and will be subject to a US $195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCI event. This credit will be good for six months from the cancellation date. In the event of non-attendance, all registration fees will be forfeited. In case of conference 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.