DISTRIBUTION SYSTEM PLANNING & OPTIMIZATION

August 10-12, 2020
Online | Central Time

EUCI is pleased to offer this virtual course on its online interactive platform. Enjoy a valuable learning experience with a smaller impact on your time and budget. You will gain new knowledge, skills, and hands-on experience in from the comfort of your remote location.

“A good event to hear about experiences from people in the same industry and transformations that are occurring in the sector.”

Delivery System Planner, Alliant Energy

EUCI is authorized by IACET to offer 1.7 CEUs for the course.
OVERVIEW

Optimizing distribution system assets is a more difficult task as distributed energy resources become a bigger player on the distribution system. Analyzing load data is essential to developing an effective forecast. This course will take attendees through traditional distribution system planning practices and move quickly into modern and future trends to be considered. Practical examples and case studies will compare a variety of capacity planning solutions (short term planning). Long term planning topics include spatial analysis and the effects of higher distribution voltages.

The course dives deep into distributed generation, providing descriptions and categorizing them with respect to their dispatchability along with other qualities. Energy storage (including EVs) has an even greater set of issues, specifically whether these devices are a source or load. System modeling must take all these components into account to create a homogenous plan for the distribution system.

The course concludes with a discussion of capital project justification and the consideration of risks associated with alternatives.

LEARNING OUTCOMES

• Review the load data industry trend – history, present day, tomorrow
• Discuss system growth – Existing customer vs. new business
• Identify sources of load profile data
• Review load forecasting rules of thumb and other assumptions
• Assess calculating loss of life due to overload for critical equipment
• Discuss the effect of system losses with regard to voltage profile and power quality
• Review options to resolving capacity issues
• Identify long term planning for substation location and capacity
• Review distributed generation classifications
• Discuss sustainability of solar generation
• Review energy storage systems
• Discuss integrating distributed energy resources
• Define microgrid, characteristics and applications

“I was skeptical about the remote learning platform but in fact I found this to be more efficient and overall better than an in person class!!! it was nice to be able to type questions out and have them answered at a good point in the discussion instead of derailing the presentation.”

Sr. Communications Specialist, Pepco Holding

“Teams was very easy to navigate and made for a great and easy platform to use.”

Deputy Director, City of Naperville - Electric Utility
AGENDA

MONDAY, AUGUST 10, 2020

8:45 – 9:00 am  Log In

9:00 am – 4:30 pm  Course Timing

12:30 – 1:00 pm  Lunch Break

System Loading
• Load Diversity/Coincidence
• Load Data
• Industry Trends
  o Then vs. Now
  o EV’s, Grow Houses, Distributed Generation, Batteries
• System Growth
  o Organic Growth (vertical – existing customers)
  o New Business (horizontal growth)
• Load Profiles – Sources
  o Distribution Management Systems
  o Data Historians
• Load Forecasting
  o Growth Assumptions and Rules of Thumb
  o Weather Impacts

Equipment Loading Practices
• Calculating Load Factor
• Normal Load Rating
• Emergency Overloads
  o Calculating Loss of Life
  o Documenting Emergency Overload Events

Calculating System Losses
• Effects System Losses on Voltage Profile

Justifying Capital Projects
• Engineering Economics
  o Net Present Value
    - All Accumulated Costs
    - All Accumulated Benefits
  o Considering Risks
    - Qualitative vs. Quantitative
## AGENDA

**Tuesday, August 11, 2020**

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<thead>
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### Short Term Planning - Resolving Capacity Issues
- Comparing Options
  - Phase Balancing
  - Shifting Load to Adjacent Circuits
  - Volt/VAr Management & Options
  - Reconductoring
  - Non-Traditional/Innovative Options
    - Conservation Voltage Reduction
    - Distribution Automation

### Long Term Planning
- Spatial Planning
  - Substations
  - Size & Location
- Effects of Higher Distribution Voltages
- Demand Side Management
  - Demand Response
- Energy Efficiencies
- Considerations for Electrification
  - Summary of Study to Electrify American Indian Reservations

### Distributed Energy Resources
- Definitions
- Distributed Generation Classifications
  - Utility/Commercial Scale vs. Consumer Scale
  - Renewable vs Non-Renewable
  - Dispatchable vs. Non-Dispatchable
  - Inertia vs. Non-Inertia Based
- Sustainability of Solar Generation
- Energy Storage Systems
  - Potential Energy
  - Battery Storage
  - EV Contributions

### System Modeling
- Model Assumptions
  - Seasonal, Daily and Hourly Profiles (ATILDA Software)
- Modeling DER
  - DG - Inverters vs. Inertia Based DG
  - Batteries - EVs
AGENDA

WEDNESDAY, AUGUST 12, 2020

8:45 – 9:00 am  
Log In

9:00 am – 12:30 pm  
Course Timing

Distributed Generation Integration Issues
- Inverter Capabilities
- Islanding
- Load Profile vs. Photovoltaic (PV)
  - Output with the Effect of Batteries or EVs
- High Penetration of PV on Distribution Circuits
- Non-Technical Issues

Introduction to MicroGrids
- Definitions & Characteristics
- Industry Standards for MicroGrids
- Applications
  - High Reliability Requirements
  - Remote Locations
  - Third World
  - Military Bases (resiliency requirements)

COURSE INSTRUCTORS

David Farmer, PE
Director of System Planning & Grid Technologies, Pike Engineering

David Farmer, PE, is the Director of System Planning & Grid Technologies for Pike Engineering. He holds a BS in Electrical Engineering from West Virginia University Institute of Technology and is a registered professional engineer in multiple states. Since 1983, Mr. Farmer has worked with electric utilities in power delivery planning, load forecasting, reliability analysis, engineering and operations, construction and design, training, and project management. David has worked for both investor owned utilities and electric cooperatives.

Jerry Josken
Senior Consultant, Pike Engineering

Jerry holds a BS in Electrical Engineering Technology from the Milwaukee School of Engineering and a MBA from North Central College. During his 30+ year career with Eaton’s Cooper Power Systems Jerry served in a variety of engineering capacities. Past leadership positions include Chair of IEEE Rural Electric Power Conference (2012) and GLEMS Distribution Equipment /Controls (2013-2014). Presently, Jerry coordinates Pike Engineering Professional Development Programs.
ONLINE COURSE DELIVERY & PARTICIPATION DETAILS

We will be using Microsoft Teams to facilitate your participation in the upcoming event. You do not need to have an existing Teams account in order to participate in the broadcast – the course will play in your browser and you will have the option of using a microphone to speak with the room and ask questions, or type any questions in via the chat window and our on-site representative will relay your question to the instructor.

- You will receive a meeting invitation which will include a link to join the meeting.
- Separate meeting invitations will be sent for the morning and afternoon sessions of the course.
  - You will need to join the appropriate meeting at the appropriate time.
- If you are using a microphone, please ensure that it is muted until such time as you need to ask a question.
- The remote meeting connection will be open approximately 30 minutes before the start of the course. We encourage you to connect as early as possible in case you experience any unforeseen problems.

INSTRUCTIONAL METHODS

Case studies and PowerPoint presentations will be used in this program.

REQUIREMENTS FOR SUCCESSFUL COMPLETION

Participants must login for the entirety of the course to be eligible for 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 1.7 CEUs for the course.
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 July 10, 2020 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 course 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.

EUCI reserves the right to alter this program without prior notice.

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Energize Weekly is EUCI’s free weekly newsletter, delivered to your inbox every Wednesday. We provide you with the latest industry news as well as in-depth analysis from our own team of experts. Subscribers also receive free downloadable presentations from our past events.

Sign me up for Energize Weekly

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ELECTRIC DISTRIBUTION SYSTEM PLANNING & OPTIMIZATION

**ONLINE COURSE:** AUGUST 10-12, 2020: US $1995 (Single Connection)

**PACK OF 5 CONNECTIONS:** US $8,978

**PACK OF 10 CONNECTIONS:** US $14,963

For volume discounts call +1.303.770.8800 for quote

*all other discounts do not apply to license packs

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Online Course Delivery & Participation Details

See page 6 for information

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

Print Name

Job Title

Company

Address

City

State/Province

Zip/Postal Code

Country

Phone

Email

CREDIT CARD INFORMATION

Name on Card

Billing Address

Account Number

Billing City

Exp. Date

Billing State

Security Code (last 3 digits on the back of Visa and MC or 4 digits on front of AmEx)

Billing Zip Code/Postal Code

OR Enclosed is a check for $__________ to cover ____________ registrations.

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To Register Click Here, or Mail Directly To:
PMA Conference Management
PO Box 2303
Falls Church VA 22042
201 871 0474
Fax 253 663 7224
register@pmaconference.com

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