EUCI
COURSE

DISTRIBUTION SYSTEM PLANNING & OPTIMIZATION

February 25-27, 2020
EUCI Conference Center
Plaza Tower One Conference Center
Denver, CO

> ***"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

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AUTHORIZED IACET PROVIDER

EUCI is authorized by IACET to offer 1.9 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

AGENDA

TUESDAY, FEBRUARY 25, 2020

8:00 – 8:30 am **Registration and Continental Breakfast**

8:30 am – 5:00 pm **Course Timing**

12:00 – 1:00 pm **Group Luncheon**

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

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

Calculating System Losses
- Effects System Losses on Voltage Profile

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

AGENDA

WEDNESDAY, FEBRUARY 26, 2020

8:00 – 8:30 am **Continental Breakfast**

8:30 am – 5:00 pm **Course Timing**

12:00 – 1:00 pm **Group Luncheon**

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

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

AGENDA

THURSDAY, FEBRUARY 27, 2020

8:00 – 8:30 am **Continental Breakfast**

8:30am – 12:00 pm **Course Timing**

Introduction to MicroGrids
- Definitions & Characteristics
- Industry Standards for MicroGrids
- Applications
  - o High Reliability Requirements
  - o Remote Locations
  - o Third World
  - o Military Bases (resiliency requirements)
  - o Case Study: The Brooklyn Microgrid
- Blockchain Transactions

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

COURSE INSTRUCTORS

John Gajda, PE
Engineering Manager, Pike Engineering, LLC

John Gajda, PE, is an Engineering Manager at Pike Engineering. John holds BS and MS degrees in Electrical Engineering from the Univ. of Arkansas and NC State, respectively. His 30 years of technical experience have been focused in the areas of distribution capacity and reliability planning, protection, and generator interconnections. In recent years John served as Director of DER Technical Standards at Duke Energy; while there he served as the primary author of Duke Energy's "DER Method of Service Guidelines," a planning guideline for DER on the T&D system. John is also a frequent guest lecturer at NC State University.

Jerry Josken
Senior Consultant, Pike Engineering, LLC

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 UCS Professional Development Programs.

INSTRUCTIONAL METHODS

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

REQUIREMENTS FOR SUCCESSFUL COMPLETION

Participants must sign in/out each day and be in attendance 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.

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EVENT LOCATION

Plaza Tower One Conference Center
6400 S Fiddlers Green Cir.
Greenwood Village, CO 80111
Located on the same property as the EUCI Office

NEARBY HOTELS

Each of these hotels offers a complimentary shuttle to and from the EUCI conference center.

Springhill Suites DTC
7900 East Peakview Ave.
Greenwood Village, CO 80111
303-721-3321
.3 miles away

Wingate by Wyndham
8000 E. Peakview Ave.
Greenwood Village, CO 80111
303-626-2641
.3 miles away

Hyatt Place DTC
8300 E. Crescent Pkwy
Greenwood Village, CO 80111
303-804-7000
2.1 miles away

Hyatt Regency Denver Tech
7800 E. Tufts Ave.
Denver, CO 80237
303-779-1234
2.8 miles away

Denver Marriott Tech Center
4900 S. Syracuse St.
Denver, CO 80237
303-779-1100
3.1 miles away

REGISTER 3, SEND THE 4TH FREE

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

REGISTRATION INFORMATION

Mail Directly To:
EUCI
4601 DTC Blvd., Ste. 800
Denver, CO 80237
OR, scan and email to: conferences@euci.com

WWW.EUCI.COM
p: 303-770-8800
f: 303-741-0849

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See nearby hotels on page 6

PLEASE REGISTER

◯ **DISTRIBUTION SYSTEM PLANNING & OPTIMIZATION**
FEBRUARY 25-27, 2020, US $2195
Early bird on or before February 7, 2020: US $1995

ENERGIZE WEEKLY

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.

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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?

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

Phone | Email

List any dietary or accessibility needs here

CREDIT CARD INFORMATION

Name on Card | Billing Address

Account Number | Billing City | Billing State

Exp. Date | 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.

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 January 24, 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 at 303-770-8800.
EUCI reserves the right to alter this program without prior notice.