

FUNDAMENTALS OF SUBSTATIONS FOR NON-ENGINEERS

September 25-26, 2018
Courtyard Denver Cherry Creek
Denver, CO

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“I highly recommend this course for project managers who are designing/building substations and recommend they take it before they start design!”

Federal Project Director, NNSA



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EUCI is authorized
by IACET to offer
1.2 CEUs for the
course

OVERVIEW

This course will introduce and provide non-technical people with the basics of a substation and all the general components that are inside a substation. General issues that are involved in the design, construction, operation and maintenance of substations and switchyards, and detailed safety awareness will be discussed. It will allow people who are not substation design engineers to know enough to oversee various aspects of a substation and will allow strong oversight of contractors and substation projects.

LEARNING OUTCOMES

- Review the basics of the power system and high-level electrical theory
- Explore an in-depth section on switchyards and substations covering their purpose, types, and configurations
- Discuss the factors to be considered in substation location and site development
- Explore the major design issues and how they affect the design of the substation structures
- List a substation's physical components and their design concerns and different configurations
- Explain the function and purpose of a substation's equipment
- List the components of a substation P&C system of controls, relays and metering
- Identify the terminology for SCADA substation components and SCADA's purpose
- Review detailed safety planning and precautions for substations and switchyards
- Explain the steps to managing the construction of a substation project



“This class was well thought out and put together with a lot of detailed information to help understand more about substations. I would highly recommend this class to all who seek further education on the basics of substation design and operations.”

Sr. Civil Engineer, Kiewit



“EUCI’s Fundamentals of Substations class is intuitive and straight forward. The speakers are credibly insightful and approachable if you have any comments or questions. I’d highly recommend this course for anyone who needs to work in and/or around substations. Whether you’re a “green” employee or seasoned veteran, this course is beneficial to all.”

Power Estimator, Henkels & McCoy

COURSE TIMING

TUESDAY, SEPTEMBER 25, 2018

7:30 – 8:00 am **Registration and Continental Breakfast**

8:00 am – 5:00 pm **Course Timing**

12:00 – 1:00 pm **Group Luncheon**

AGENDA

Power Basics

- Review a few key contributors to the power industry
- Review the basic elements of the power system
- Review concepts such as voltage, current, frequency & power
- Understand the differences between AC/DC
- Understand the sources and loads

Purpose of Substations & Switchyards

- The purpose of substations and the difference between a substation and a switchyard
- Differentiate between sources and loads
- Why voltage conversion is a critical part of the utility network
- Difference between phasing and phase rotation and how to apply this
- Different types of substation configurations
- The pros/cons of each configuration
- Understand the concepts of reliability as applied to different types of substations
- Identify zones of protection
- Define breaker failure

Site Considerations

- Factors to be considered in site selection and development
- The purpose of Topographic Surveys and Geotechnical Reports
- Understand grading considerations for new substation site locations

Civil-Structural Considerations

- Basic information to produce a civil/structural design package
- Understand how to read the drawings
- Have a basic understanding of the major design issues and how they affect the design of the substation structures

Physical Components

- Understand the breakdown of the substation physical components
- Have a basic understanding of the main design concerns and approaches

Substation Equipment

- Understand the function of various substation equipment items
- Determine the important ratings and application of these items
- The most frequent errors to watch out for
- How to apply the equipment in a substation

COURSE TIMING

WEDNESDAY, SEPTEMBER 26, 2018

7:30 – 8:00 am **Continental Breakfast**

8:00 am – 12:00 pm **Course Timing**

AGENDA

P&C Components

- The components of a P&C system in a substation
- How the terms dependability and security are applied to protective relaying
- Major types of relaying in a substation
- The function of different systems (control, relaying and metering) in a substation control enclosure

SCADA Communications

- Terminology used to identify substation SCADA components
- The purpose of Control, Alarm and Metering SCADA points
- The purpose of the Points List
- Telecommunication requirements/considerations

Safety in Substations and Switchyards

- Safety regulations
- Personal safety considerations
- Electrical safety awareness
- Equipment precautions
- Chemical safety considerations
- Danger and hazard awareness
- Safety planning examples

Managing Substation Construction Projects

- Follow a substation project timeline
- Understand a substation project construction sequence
- Elements of managing a substation project schedule
- Know some of the construction equipment and tooling used in a substation construction project
- Elements of quality management on a substation construction project



“Training was awesome! Will recommend to other managers/supervisors. Very well organized. Location was great, food was good!”

Construction Manager, Saulsbury

INSTRUCTORS



Jan Risla

Project Manager, POWER Engineers, Inc.

Jan Risla is a Senior Project Manager at POWER Engineers with over 30 years' experience in the power delivery industry. Mr. Risla is highly skilled in all phases of electrical project design, construction and commissioning. His professional experience includes personal responsibility for design and/or construction of 23 power plants, 47 substations, more than 120 miles of overhead line and more than 60 miles of high-voltage underground cable installations.



Chris Pierce

Senior Project Engineer, POWER Engineers, Inc.

Chris graduated with his BSEE from Ohio University in 2005 and obtained his MBA from Ohio State in 2010 while working for American Electric Power. He has worked for POWER Engineers for over 6 years and has also spent time in his career working for AEP and ABB in a myriad of roles. Chris is currently the Substation Department Manager in Denver, CO and is a registered Professional Engineer in Ohio.



"This was a very useful course and time well spent educating myself on substation fundamentals."

Vice President, Enerfab Power & Industrial, Inc.



"Great basic overview of substation and their electrical components."

Assistant Project Manager, McCarthy

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.

INSTRUCTIONAL METHODS

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

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 1.2 CEUs for the course.

EVENT LOCATION

A room block has been reserved at the 1475 S. Colorado Blvd, Denver, CO 80222, for the nights of September 24-26, 2018. Room rates are US \$139 plus applicable tax. Call **1-303-757-8797** for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is August 24, 2018 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 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
to register [CLICK HERE](#) or

Call: 201 871 0474
fax: 253 663 7224
email: register@pmaconference.com
web: <http://pmaconference.com/>
Mail: POB 2303 Falls Church Va 22042

Please make checks payable to: "PMA"

EVENT LOCATION

A room block has been reserved at the Courtyard Denver Cherry Creek, 1475 S. Colorado Blvd, Denver, CO 80222, for the nights of September 24-26, 2018. Room rates are US \$139 plus applicable tax. Call **1-303-757-8797** for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is August 24, 2018 but as there are a limited number of rooms available at this rate, the room block may close sooner. **Please make your reservations early.**

PLEASE REGISTER

FUNDAMENTALS OF SUBSTATIONS FOR NON-ENGINEERS COURSE:

September 25-26, 2018 | Denver, CO: US \$1395
 Early bird on or before September 7, 2018: US \$1195

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

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 August 24, 2018 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 (201) 871-0474.