FUNDAMENTALS OF SUBSTATIONS FOR NON-ENGINEERS

November 15-16, 2016
San Diego Marriott La Jolla
San Diego, CA

EUCI is authorized by IACET to offer 1.0 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 various substation projects.

WHO SHOULD ATTEND

• Maintenance and operations staff
• Transmission and distribution contractors
• Engineering and design consultants
• Non-electrical engineers
• Transmission and distribution operators
• Project managers

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 approaches
• 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
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.

Randy Silbaugh / Senior Engineer, POWER Engineers, Inc.

Randy has over 30 years of SCADA and communications experience across a wide array of utility systems. He has worked for POWER Engineers for 6 years after many years as an engineer and technician at PacifiCorp, Black & Veatch, Portland General Electric, and the US Navy. Randy is currently a senior SCADA engineer in San Diego, CA and is a registered Professional Engineer in Oregon.

William Harrison / Project Engineer, POWER Engineers, Inc.

William Harrison graduated with his BSEE from Ohio University in 2004. After college William joined the United States Marine Corps from 2004 – 2008 where her served as an avionics technician. Will joined POWER Engineers in 2008 and is currently a project engineer in the San Diego Power Delivery group.

Chin Mou / Project Engineer, POWER Engineers, Inc.

Chin Mou graduated with his BSEE from University of California, San Diego in 2005. Chin joined POWER Engineers upon completion of his degree and is currently a Project Engineer and the Department Manager for the Substation Engineering department in the San Diego Power Delivery group.
AGENDA

Tuesday, November 15, 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

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
- Know the purpose of substations and the difference between a substation and a switchyard
- Differentiate between sources and loads
- Understand why voltage conversion is a critical part of the utility network
- Know the difference between phasing and phase rotation and how to apply this
- Know the different types of substation configurations
- Understand 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
- Understand the factors to be considered in site selection and development
- Know the purpose of Topographic Surveys and Geotechnical Reports
- Understand grading considerations for new substation site locations

Civil-Structural Considerations
- Know the 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
- Know the most frequent errors to watch out for
- Understand how to apply the equipment in a substation
AGENDA

Wednesday, November 16, 2016

8:00 – 8:30 a.m.    Continental Breakfast
8:30 a.m. – 5:00 p.m.  Course Timing
12:00 – 1:00 p.m.  Group Luncheon

PC Components
• Have a basic understanding of the components of a P&C system in a substation
• Understand how the terms dependability and security are applied to protective relaying
• Have a basic knowledge of the major types of relaying in a substation
• Understand the function of different systems (control, relaying and metering) in a substation control enclosure

SCADA Communications
• Know the terminology used to identify substation SCADA components
• Know the purpose of Control, Alarm and Metering SCADA points
• Know 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
• Understand elements of managing a substation project schedule
• Know some of the construction equipment and tooling used in a substation construction project
• Understand elements of quality management on a substation construction project

TESTIMONIALS FROM PAST ATTENDEES

“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

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

“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
INSTRUCTIONAL METHODS

Case studies and PowerPoint presentations will be used.

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.

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 1.5 CEUs for the course.

EVENT LOCATION

A room block has been reserved at the San Diego Marriott La Jolla, 4240 La Jolla Village Dr., La Jolla, CA 92037, for the nights of November 14-15, 2016. Room rates are $209, plus applicable tax. Call 1-858-587-1414 for reservations and mention the EUCI course to get the group rate. The cutoff date to receive the group rate is October 13, 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.

PROCEEDINGS

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

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.

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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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.

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 October 14, 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 (201) 871-0474.

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Please make checks payable to: “PMA”