

## **Distribution Overcurrent Protection**

February 20 – 22, 2018

Charleston, SC

### ***What is this course about?***

This course focuses on the application of protective devices for electric distribution systems including device coordination, reach, location, and selection, with the goal of maximizing system reliability. The training will utilize practical examples to reinforce the classroom concepts. UCS training is vendor-neutral and focused on the technical engineering protection issues, not any specific manufacturer's equipment or device. The course includes the following:

- Review of modern distribution system overcurrent protection and sectionalizing practices
- Overview of fault calculations, impedance, and the per-unit system
- The impact of system design, equipment selection, and protection practices

It is recommended for attendees to bring an engineering calculator to class. Smart phones with scientific calculator function would also serve this purpose.

### ***Who should attend?***

Distribution engineering and technical personnel of any experience level who desire to gain a better understanding of distribution system protection or need a review of protection and sectionalizing practices. Anyone seeking an overview of contemporary protection practices and a review of calculations used to compute fault currents and reliability impacts will find this course helpful.

### ***Continuing Education Credits***

Upon completion, attendees will receive a certificate for 18 Professional Development Hours (PDH). UC Synergetic Courses have never been refused as continuing education by any State PE Board.

### ***Instructor Bios:***

Kent Hoffman, PE, is a Senior Consultant for UC Synergetic. Kent, a graduate of NC State University, brings over 40 years of experience in distribution system protection, standards, and reliability. During his career at Progress Energy, Mr. Hoffman held various technical leadership positions, including Manager of Distribution Planning & Coordination, where he was responsible for standards and practices related to distribution system protective coordination. He has served on numerous technical committees and currently assists with UC Synergetic training programs and projects.

Jerry Josken is a Senior Consultant for UC Synergetic. 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 has served as Test Engineer, Design Engineer, Distribution Protection Engineer and Field Application Engineer. Past leadership positions include Chair of IEEE Rural Electric Power Conference (2012) and GLEMS Distribution Equipment /Controls (2013-2014). Presently, Jerry coordinates UCS Training Programs.

## Distribution Overcurrent Protection Course Outline

### *Distribution Protection Fundamentals*

- Fault Current Calculations
  - Per Unit System
- Phase/Ground Faults
- Temporary /Permanent Faults
- Time-Current Characteristic Curve

### *Overcurrent Protective Devices*

- Load and Interrupting Ratings
- Fuses
  - Minimum Melt/Total Clear
  - Expulsion/Current Limiting Fuses
- Reclosers
  - Dual Timing Characteristics
  - Design Options
  - Control Types & Settings
- Relay-Controlled Circuit Breakers
  - Types of Breakers
  - Electromechanical Relays
  - Microprocessor-based Relays
- Sectionalizers
  - Applications
  - Role in Protection Scheme

### *Protection Philosophy*

- Overhead vs. Underground

### *Device Coordination & Application*

- Fuse/Fuse
- Substation Breaker/ Fuse
- Recloser/Fuse
- Sectionalizer/Recloser

### *Underground Distribution Protection*

- Switchgear and protective equipment

### *Distribution System Reliability*

- Reliability Indices
- Identifying Sectionalizing Points
- Effect of sectionalizing on reliability

### *Distributed Generation Protection*

### *Sample Problems*

- System Modeling
- Fault Current Calculation
- Reading Time Current Curves
- Device to device coordination

### Class Schedule:

- 2.5 days in duration
  - Tuesday & Wednesday 8:30AM to 4:00PM (lunch & snacks provided)
  - Thursday 8:30AM to noon

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### ***Course Location***

The course will be held at the Hampton Inn Historic District – Charleston, SC

Hampton Inn  
345 Meeting Street  
Charleston, SC 29403

### ***Lodging***

Recommended hotels:

Hampton Inn  
345 Meeting Street  
Charleston, SC 29403  
Phone: 843-723-4000

### ***Course Registration***

The course tuition is \$1495 per person. Tuition will include course materials, refreshments, and lunches all three days of class. Any company with four or more attendees will save 25%. UC Synergetic clients are eligible for discounts. Contact Jerry Josken ([jjosken@ucseng.com](mailto:jjosken@ucseng.com)) to obtain the discount codes.

Hotel accommodations, transportation and other incidentals will be the student's responsibility.

Cancellations received after February 9, 2018 will receive a credit that can be used for tuition on a future UC Synergetic Course. The credit is good for one year and is transferable within the same company. In the unlikely case of course cancellation, UC Synergetic liability is limited to refund of the course registration fee only.

[Click here to register online](#) or complete the attached registration form.

For additional information about this course, other UCS course offerings, or on-site pricing, please contact Jerry Josken at (919) 348-3432 or via e-mail at: [jjosken@ucseng.com](mailto:jjosken@ucseng.com).



Registration Form – Distribution Overcurrent Protection
February 20–22, 2018
Charleston, SC

Payment methods:

By check, payable to UC Synergetic, Inc. Please attach check to the registration and mail to the address below.

--or--

By credit card. An electronic invoice will be sent to you via email\*\*. This is a secure payment method through PayPal. It does not require a PayPal account.

Circle one: Enclosed is a check for / Please charge my credit card for the following:

\_\_\_\_\_ persons at \$1495.00 per person, a total of \$\_\_\_\_\_

Please Complete the Information Below:
(attach additional sheets for multiple registrations)

Name \_\_\_\_\_ Title \_\_\_\_\_

E-mail\*\*
\_\_\_\_\_

\*\*Please provide email address if you would like confirmation of your registration or would like to pay online through PayPal.

Company: \_\_\_\_\_

Telephone: \_\_\_\_\_

Fax: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

For payment by check, PO, or other
questions regarding payment, please contact:

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