DISTRIBUTION OVERCURRENT PROTECTION

August 23-24, 2016
Hilton Orrington/Evanston
Chicago, IL

FEATUREING A TOUR OF S&C ELECTRIC COMPANY’S ADVANCED TECHNOLOGY CENTER*
August 23, 2016

EUCI is authorized by IACET to offer 1.0 CEUs for the course.
OVERVIEW

This course focuses on the application of protective devices to distribution systems including device coordination, reach, location, and selection, with the goal of maximizing reliability impact and safety. 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

LEARNING OUTCOMES

- Define and describe the major concepts distribution system protection
- Explain considerations that impact reliability, and how the protection scheme impacts system performance
- Discuss smart grid technologies that are impacted by the protection scheme
- Gain a strong foundation on the basic concepts and equipment used in modern distribution system protection
- Recognize challenges and opportunities for utilities in the future related to system protection and reliability
- Discuss advanced technology that offers a new tool for dealing with distribution faults
- Review a new tool for dealing with lateral faults

TOUR

Tuesday, August 23, 2016

Featuring a tour of S&C Electric Company’s Advanced Technology Center*

Tour Timing: 11:00 a.m. – 2:00 p.m.
Boxed Lunch will be provided.

*Due to the proprietary nature of the tour, the tour will not be open to equipment manufacturers as determined by EUCI.
AGENDA

Tuesday, August 23, 2016

2:00 – 2:30 p.m.   Registration
2:30 - 5:30 p.m.   Course Timing

I. Distribution Protection Fundamentals
   • Distribution Systems
   • Types of Faults
   • Selective Coordination
   • Minimizing Customer Impact
   • Fault Calculations

II. Protective Equipment and Characteristics
   • Time-Current Characteristic Curves
   • Fuses
     o Minimum Melt
     o Total Clear
   • Reclosers
     o Fast and Slow Cures
     o Hydraulic and Electronic
     o Control Settings and Types
   • Relay-Controlled Circuit Breakers
     o Types of Breakers
     o Electromechanical Relays
     o Microprocessor-based Relays
     o Phase and Ground Relays
   • Sectionalizers
     o Applications
     o Role in Protection Scheme
     o How they Operate
   • Specialized Protective Devices

Wednesday, August 24, 2016

7:30 - 8:00 a.m.   Continental Breakfast
8:00 a.m. – 5:00 p.m.   Course Timing
12:00 - 1:00 p.m. Group Luncheon

III. Device Coordination and Application
    • Identifying Sectionalizing Points
    • Device Load and Interrupting Ratings
    • Protection Zones and Reach
    • Coordination Margins
    • Coordination Between Devices
    • Equipment Protection
    • Distributed Generation Protection

IV. Reliability and Power Quality Impacts
    • Reliability Indices
    • Sectionalizing for Reliability
    • Power Quality Issues

V. Protection Problems and Solutions

VA. Advanced Technology Now Offers a New Tool for Dealing with Distribution Faults

Advanced technology now offers a new tool to ascertain whether distribution faults are permanent or transient without repeatedly reclosing back into faults that turn out to be persistent, thereby subjecting the system to multiple high magnitude faults. While of significant value solely as a method to extend the life of substation transformers by reducing cumulative I2T let-through damages, this technology also provides additional benefits by enabling a number of communication independent Smart Grid functions that enhance feeder reliability and improve power quality. This paper will discuss PulseClosing® technology and then focus on its ancillary benefits:

• This new technology reduces cumulative I2T damage by 95%, eliminating voltage sags produced by reclosing into faults, reducing conductor movement/galloping and reducing stresses on splices, cables and other vital Distribution equipment.
• This new technology eliminates Mag Inrush, which can exceed 30 to 35 times full load current on small single phase transformers.
• This new technology allows these new devices to automatically recover from miscoordination with no dependence on communications, allowing any number of the new devices in series to properly segment a fault even where Time Current Coordination cannot be obtained.
• This new technology averts the needless momentaries associated with conventional Fuse Savings when a conventional recloser can’t beat the fuse.

VB: A New Tool for Dealing with Lateral Faults

A new tool is now available for dealing with Lateral Faults that applies proven technology in a radically new way to reduce costs while minimizing momentaries and improving system reliability. The presentation looks into the problem of how faults on the lateral lines are hurting the utility’s reliability and costing both the utility and their customer’s money. We will compare & contrast the advantages and disadvantages of the only two historical approaches for dealing with Lateral Faults; i.e., “Fuse Blowing” versus “Fuse Saving” strategies. We will then discuss a new approach, a Lateral Reclosing Protection Scheme that leverages a new cutout mounted recloser. This new tool is a battery-free, self-powered and fully user configurable Vacuum Recloser with up to four shots to lockout that installs in a conventional cutout body greatly simplifying installation and significantly reducing costs while offering the best of both worlds in terms of Fuse Savings versus Fuse Blowing philosophies. This presentation will cover the features and functions of this new product that combines the simplicity of a fuse with the technology of a recloser to enhance reliability and reduce momentaries.

VI. Regulatory and Financial Considerations
    • Benchmarking against other utilities
    • Regulatory standards and compliance
    • Internal and external rate justification
INSTRUCTORS

Dave Kearns / Application Director, Smart Grid Technologies / S&C Electric Company

Dave has accumulated over thirty years experience in distribution engineering, project management, automated switchgear applications, and Distribution Automation sales/marketing from both sides of the utility industry. He has also authored and presented numerous papers at various industry forums, including DistribuTECH and the IEEE T&D Conferences on a variety of DA related topics and projects. Current responsibility with twenty years experience has been as Application Director, SG Technologies for the Northeast Region for S&C Electric Company. He was also involved in the initial development and marketing of the IntelliTEAM® Switching System during a short stint at EnergyLine Systems, which was purchased by S&C in 1999. Responsibilities also include sales and marketing support for IntelliTEAM® applications in the Pacific Rim.

Other principal project involvement with S&C, primarily in Distribution Automation, included responsibility for the commercial launch of Scada-Mate® Switching Systems, Remote Supervisory Pad Mounted Gear and the Micro-AT Source Transfer Control. While at S&C, his responsibilities also included working with numerous customers in the development of a wide variety of D/A applications, along with direct participation in the original development of IntelliTEAM® with EnergyLine, S&C and Commonwealth Edison of Chicago. Prior to S&C, Mr. Kearns has three years experience as Product Manager for VacPac Switching Systems with Kearney Company in Portland, OR.

Preceding that, Dave had fifteen years experience in distribution engineering with Kentucky Utilities, the last position as Lexington District Engineer responsible for all overhead and underground distribution design and construction for a metropolitan area of 200,000, comprising 33% of total KU demand and 25% of total company revenue.

James K. Niemira, PE / Principal Engineer / S&C Electric Company

James K. Niemira, PE, is a Principal Engineer of S&C Electric Company in the Power Systems Solutions organization. He has over 30 years of professional experience in the electric power industry. Present responsibilities include oversight of design work in the Engineering Services Department including substation physical design, protection and control system design, SCADA and communications, and review of analytical studies. Mr. Niemira has done design work, field start-up, and commissioning of renewable energy power plant substations and data center substation sites, expansions of existing substations, battery energy storage systems, and protective relay schemes on medium voltage distribution systems. He is intimately involved in distribution system protection and automation projects involving S&C’s HSFCS (High-Speed Fault Clearing System) equipment, substation design, and collector system design for renewable energy generation sites (wind and solar). His expertise includes power system analysis, power equipment application, and technical instruction: overcurrent coordination, power system protective relaying, fault studies, arc flash, switching transient studies using the EMTP and ATP; analysis for thermal up-rating of substations, and grounding studies. He is active in the IEEE/PES Power System Relaying Committee and is a Member of the PSRC Main Committee. He is co-author and presenter of seminars including Short-Circuit Analysis, Distribution Overcurrent Protection and Coordination, Power Quality, and Capacitor Switching Transients, SCADA, Fundamentals of Wind Power Plant Design, and Fundamentals of Power System Relaying. He has been a guest lecturer at various universities for courses on design of wind power generation plants, protective relaying of power systems, electric power distribution system protection, and SCADA. He is author of a text book chapter on protective relaying of renewable plants.

Mr. Niemira earned the BSEE degree from the University of Missouri at Rolla (now known as Missouri University of Science and Technology) and the Master of Engineering in Electric Power Engineering from Rensselaer Polytechnic Institute in Troy, NY.

Mr. Niemira is a licensed professional engineer in 30 states. He is a member of the National Fire Protection Association (NFPA). He is a member of the IEEE since 1985, and Senior Member since 2001. He is a past Chair of the IEEE Power and Energy Society Chicago Chapter. He is a Main Committee Member of the IEEE/PES Power System Relaying Committee.

Michael Higginson / Project Engineer / S&C Electric Company

Michael Higginson is a Project Engineer in the Power Systems Solutions business unit of S&C Electric Company with over four years of experience in the electric power industry. Michael's primary responsibilities include power system analysis for utility, commercial, and industrial customers. He has been involved in more than ninety projects involving power system analysis, commonly including load flow, short-circuit, protection coordination, arc flash, flicker, and generator interconnection studies. He has focused on power system protection, including fault analysis and relaying.

Michael holds a B.S. degree in Electrical Engineering from the University of Notre Dame, and is currently pursuing a M.S. degree in Electrical Engineering from Illinois Institute of Technology. He is an Enrolled Professional Engineer Intern in the State of Illinois.
INSTRUCTIONAL METHODS

This course will feature PowerPoint presentations and in-class exercises.

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.

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

A room block has been reserved at the Hilton Orrington/Evanston, 1710 Orrington Ave., Evanston, IL 60201, for the nights of August 21-23, 2016. Room rates are $189 single & double, plus applicable tax. Call 1-847-866-8700 for reservations and mention the EUCI course to get the group rate. The cutoff date to receive the group rate is March 16, 2015, 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 THE 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.
PLEASE REGISTER THE FOLLOWING

☐ DISCOUNTED REGISTRATION FOR ATTENDING BOTH FUNDAMENTALS OF ELECTRIC DISTRIBUTION AND DISTRIBUTION OVERCURRENT PROTECTION
   AUGUST 22-24, 2016: US $2195
   EARLY BIRD ON OR BEFORE AUGUST 5, 2016: US $1995

☐ DISTRIBUTION OVERCURRENT PROTECTION COURSE ONLY
   AUGUST 23-24, 2016: US $1395
   EARLY BIRD ON OR BEFORE AUGUST 5, 2016: US $1195

☐ YES, I WOULD LIKE TO ATTEND THE TOUR OF S&C ELECTRIC COMPANY’S ADVANCED TECHNOLOGY CENTER* AUGUST 23, 2016

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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? Address

City State/Province 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 July 22, 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 303-770-8800.

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

EUCI's Energize Weekly e-mail newsletter compiles and reports on the latest news and trends in the energy industry. Newsletter recipients also receive a different, complimentary conference presentation every week on a relevant industry topic. The presentations are selected from a massive library of more than 1,000 current presentations that EUCI has gathered during its 28 years organizing conferences.

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