



Education and networking for the electric energy industry.

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6855 S. Havana, Ste 430 ~ Centennial, CO 80112



Education and networking for the electric energy industry.



Transmission Line Design Workshop

NERC APPROVED
CONTINUING EDUCATION COURSE

April 8, 2010

DATE, TIME, LOCATION

April 8, 2010

Workshop: 8:30 a.m. - 4:30 p.m.

Denver Marriott South at Park Meadows

10345 Park Meadows Drive

Littleton, CO 80124

Phone: (303) 925-0004

Fax: (303) 925-0005

Web Site: <http://cwp.marriott.com/denms/rmel/>

Reservations:

Call (800) 686-2767 or (303) 925-0004 for room reservations at the Denver Marriott South at Park Meadows. A special room rate of \$124 single or double is available when you mention RMEL. The reservation deadline to receive this rate is **March 24, 2010**.

Directions to the Denver Marriott South:

From I-25: Exit at Lincoln Avenue, exit #193. Go west on Lincoln. Turn right at next light, which is Park Meadows Drive. Hotel is on the right. Parking is complimentary. For customized driving directions go to www.mapquest.com.

Shuttle service from the airport: Super Shuttle, (800) 258-3826.

Complimentary hotel shuttle service within a 5 mile radius.

WORKSHOP DESCRIPTION

The workshop will cover advanced transmission line design procedure and engineering practices; explore the concept of what the engineer can and can't control and how those factors affect line design; how the forces of reliability, economy, and aesthetics interact in the design and siting of lines; and a discussion of the line design process with examples and illustrations of all the concepts.

The preparation of line design criteria will be thoroughly discussed. The legislative, environmental, construction and maintenance requirements; reliability requirements; safety codes; and ambient conditions will be integrated into the design criteria discussion. Line design calculations will be covered.

WHO SHOULD ATTEND

The course is for engineers and designers who have some basic knowledge of transmission line design. Even the most experienced engineer will benefit from the advanced concepts of the course. Those who interact with the public in the course of permitting and routing lines will also benefit from the material discussed.

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WORKSHOP OUTLINE

1. **What is the design process?**
2. **What is the line designer's responsibility?**
 - a) To the company
 - b) To the public
 - c) To the environment
3. **What can you and can't you control? What difference does it make?**
 - a) Return period concepts
4. **What is a "Safe" line?**
 - a) What is a "Safe" line?
5. **What is a "Reliable line?"**
 - a) How reliable is "reliable"?
6. **Load factors and strength factors**
7. **Selection of design parameters**
8. **Structure design considerations**
9. **Conductor design considerations**
 - a) Ampacity
 - b) Corona
10. **Insulators and insulation coordination**
 - a) Lightning protection

QUESTIONS

Have additional questions about this event? Please ask us.
Call RMEL at (303) 865-5544. Fax your registrations to (303) 865-5548.
RMEL is also on the web at www.RMEL.org.

WORKSHOP OBJECTIVES

- Understand how to develop a rational design criteria for a line and understand why it is critical to the long-term success of the line
- Understand the structural concept of a transmission line as a continuous system
- Understand the electrical nature of the line
- Understand and balance financial, operational and aesthetic issue in design
- Learn how to design a reliable transmission line
- Learn line design calculations
- Understand the limitations of safety codes as design criteria for transmission lines

WORKSHOP INSTRUCTORS

Peter Catchpole, Sr. Project Manager, POWER Engineers, Inc.
Glenn Davidson, Sr. Project Manager, POWER Engineers, Inc.

Mr. Catchpole graduated from Queen's University at Kingston, Ontario with a Civil Engineering degree in 1971. In the 38+ years since, he has developed broad experience in consulting engineering, utility engineering and construction management. His positions have included inspector, surveyor, field engineer, senior design engineer, project engineer and project manager. Since 1977, Mr. Catchpole has worked primarily with or for electric utilities. His current role is Senior Project Manager for overhead line projects at POWER Engineers, Inc.

Mr. Davidson graduated from Newark College of Engineering (Now part of New Jersey Institute of Technology) with BSEE and MSEE degrees in 1964 and 1967. His 45 years of experience have all been in Transmission Line design. His current position is Senior Project Manager in the T&D Division at POWER Engineers, Inc., responsible for transmission line projects in the US and internationally. Mr. Davidson is the Chairman of the Towers, Poles, and Conductors Subcommittee of the IEEE.

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RMEL CONTINUING EDUCATION CERTIFICATE

All attendees will receive a continuing education certificate worth **8.0 Professional Development Hours (PDHs)** by RMEL, upon completion of the course. RMEL serves a large territory in which attendees participate in a number of accrediting organizations, each with their own requirements. Depending on the certifying body you are affiliated with, RMEL PDHs may be applied towards your recertification credit. It is the responsibility of the attendee to determine if the credits are applicable to their certifying body and how they may be applied. Use the event brochure, and agenda to determine how the content applies to your certification. The attendee is also responsible for verifying how the quantity of RMEL PDHs convert to your certifying body credits. Typically 1.0 PDH is equal to .1 CEU, but you should always verify the conversion scale.

NERC CONTINUING EDUCATION HOURS

This RMEL workshop has been certified with the North American Electric Reliability Corporation (NERC) as an approved learning activity for which NERC CE Hours (CEHs) can be granted. **Students enrolling for NERC CEHs and successfully completing this course will be credited with 8.0 NERC CEHs.** Students must submit their NERC System Operator ID on the back of this brochure when registering. A \$50 NERC CE Credit Fee will apply. NERC CEHs will be submitted by RMEL to NERC within 30 days of successful course completion. Participants will receive a NERC CEH certificate of completion. Participants will be required to demonstrate sufficient knowledge of course learning objectives in order to receive NERC CE Credit. RMEL adheres to all NERC Continuing Education program criteria. Please visit www.RMEL.org for additional information.

NERC APPROVED
CONTINUING EDUCATION COURSE

This workshop is certified and approved with the NERC Continuing Education (CE) Program and will qualify for 8.0 NERC CE credits upon successful completion.

ISSUE BACKGROUND

A transmission line is an integral part of a power system. New line projects including extra high voltage – 345, 500 and 765 kV – are receiving increased attention as efficiency and reliability are becoming more critical. Lines that until recently, cost in the hundreds of thousands of dollars a mile to construct are now costing in the millions of dollars a mile. Nature imposes many different loads on lines and the materials used for transmission line structures. Structures, conductors, and insulators react differently to the loads nature imposes. The designer's job is to economically and reliably resist the assaults of nature while mitigating the impact of the line on the environment.

Transmission Conference: Evolution of the Grid

March 9 - 10, 2010
Denver Marriott South
Denver, CO

This conference focuses on how energy companies are overcoming major challenges – physical, economic and social – to transform power delivery systems. Presentations will discuss visions for an interstate transmission system, cover the costs and benefits of extra high voltage lines and showcase proposed and planned projects that include high voltage direct current lines and converters. Attendees will also receive an update on the Western Renewable Energy Zone (WREZ) Transmission Model and federal funding opportunities.

Who Should Attend:

Management and senior management, engineers, consultants, regulators and project managers involved in planning, building, operating and maintaining transmission systems should attend this conference. Attendees of the Transmission Conference are encouraged to attend the roundtable discussion.

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REGISTRATION FORM

How to Register:
Online - Register online at www.RMEL.org
Phone - Call RMEL at (303) 865-5544
Fax - Fax your form to (303) 865-5548
Mail - Send your form and payment to RMEL

YOU DO NOT NEED YOUR MEMBER ID TO REGISTER. However, to save time when filling out this form, you may simply list your member ID number rather than fill out all the contact information. If you do not have an ID or do not remember it, complete the entire form and you will be assigned an ID number. Each individual of a member company is assigned their own personal member ID.

Name: _____ Your Personal RMEL Member ID#: _____

..... *No RMEL Member ID? No Problem. Please provide the following instead:*

First Name: _____ Last Name: _____

Title: _____

Company Name: _____

Company Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

Email: _____

RMEL Transmission Line Design Workshop - April 8, 2010 8:30 a.m. - 4:30 p.m.

Includes: Continental breakfast, breaks, lunch, training, course materials, attendee roster, and upon course completion, a continuing education certificate.

- Member full-day meeting \$480
- Non-RMEL member full-day meeting \$580
- NERC CE Credit Fee (Must provide NERC System Operator ID Below) \$50

Total. _____

For NERC CEH Credit, You Must Provide Your NERC System Operator ID#: _____

PAYMENT INFORMATION

- Check (RMEL; 6855 S. Havana, Ste 430; Centennial, CO 80112)
- Visa Master Card or American Express

Card#: _____ Exp. Date: _____

Signature: _____

Cancellation Policy: Fees are refundable if cancellation is received on or before 5 p.m., **March 29, 2010**. If cancellation is received after that date, half the registration fees will be refunded. Payments will be processed for those who do not attend or do not cancel by 5 p.m. the day before the event. To have someone take your place, please notify RMEL anytime before the event.