

TRANSMISSION LINE ENGINEERING COURSE

Sargent & Lundy's Power Delivery Services Group conducts four days of training in transmission line design for our clients in the utility industry. Training is conducted in our Chicago, Illinois office by engineers engaged in utility transmission line design and engineering. Since the course was first introduced in 1994, it has been attended by more than 900 utility professionals from throughout the United States and overseas.

Who Should Attend?

The course is intended for utility engineers, project managers and other professionals involved with transmission line projects. In particular, entry level engineers or experienced professionals who are new to this area of the electric utility business will benefit from the course.

What You Will Learn

This 4-day course provides a comprehensive review of the fundamentals of transmission line engineering. Each day of the course has been developed to cover specific tasks and activities pertaining to line design. For example, in the structure spotting session the information necessary to perform structure spotting will be reviewed and the class participants will design a section of line. In the session on structure types, the various materials and configurations for transmission structures are addressed and the engineer will evaluate alternate structure types in a project-based case study. Throughout the course, the attendees will participate in design examples and case studies to apply the principles learned. Each attendee receives a copy of all classroom exhibits for future reference.



Course Fees...

The 4-day course in Sargent & Lundy's Chicago office is offered at the cost of \$1,925. The price will be reduced to \$1,825 if payment is received by Sargent & Lundy one week prior to course start date. Credit card payment is now accepted through our website. The fee covers supporting text, course materials, continental breakfasts and lunches.

Participants receive a certificate of completion and one continuing education unit for every 10 hours of classroom instruction. Refer to specific state requirements for applicable Professional Development Hour (PDH) credits. Utility on-site sessions for 15 or more students are also available. Please call for information.

32 Professional Development Hours


For registration information, contact...

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Day 1 Power System Analysis, Route Selection, & Design Criteria

Session 1 will provide students with an introduction to power system analysis and factors influencing transmission line design, including insulation coordination, sharing rights-of-way and transmission access. In Sessions 2 and 3, the engineering aspects of selecting a transmission line route will be covered. Students will gain an understanding of the parameters to be included in the design criteria for a line and learn how these criteria can impact the cost of a project.

Instructor: Thomas B. Thorsell

Session 1 – Power System Analysis

- Types of studies
- Data requirements and sources
- Study results and implications
- Relation to equipment selection
- Insulation coordination

Instructor: Ross Smith

Session 2 – Route Selection

- Routing objectives
- Identifying information sources
- Compiling/interpreting information
- Evaluating alternatives
- Selecting final alignment

Session 3 – Design Criteria

- Applicable codes and standards
- Establishing clearances
- Structural loading conditions
- Lightning performance
- Sag/tension limits
- Environmental effects

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Day 2 Structure Spotting, Conductors, Insulators, & Hardware

In Session 4 students will learn the fundamentals of structure spotting and participate in the selection of structure locations in a sample line section. Sessions 5, 6 and 7 will cover the characteristics of the various types of conductors and overhead ground wires. Considerations for selecting types of insulators will be discussed, including comparisons of the characteristics of porcelain and polymer insulators. Students will gain an understanding of the requirements for the various hardware components used on a line and the factors that should be considered in selecting components for insulator and hardware assemblies.

Instructor: Ross Smith

Session 4 – Structure Spotting

- Plan and profile requirements
- Structure and line design information
- Cost considerations
- Site-specific conditions
- Applying spotting concepts to computerized methods

Session 5 – Conductors

- Types and material comparisons
- Strength and ampacity
- Sizes and codes
- Configurations
- Corona

Session 6 – Insulators

- Types and general selection criteria
- Contamination and degradation
- Testing and specifying

Session 7 – Hardware

- Materials, strength, & safety factors
- Testing

Day 3 Transmission Line Structures

Sessions 8, 9 and 10 will cover the types of structures used for transmission lines. Students will learn how to evaluate these structures for applications on specific types of projects. The concepts involved in developing the structure configuration and design loadings will also be addressed, and the Fundamentals of structure design will be presented. Students will participate in case studies that illustrate these concepts.

Instructors: Subir Roy / Brian C. Wood

Session 8 – Structure Types

- Circuit/structure configurations
- Materials
- Evaluating costs
- Structure families
- Construction/maintenance considerations

Session 9 – Structure Design Criteria

- Codes
- Standards
- Design guides
- Climatic loads
- Construction and maintenance loads
- Security loads
- Displacements
- Reliability considerations
- Load combinations and overload factors

Session 10 – Structure Design

- Design guides and standards
- Pole, lattice, framed, and guyed structures
- Structure/foundation interaction
- Computer software
- Structure detailing and testing
- Review vendor designs and details

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Day 4 Foundation Design

The types of foundations used to support transmission line structures will be covered in Sessions 11, 12 and 13. Students will learn how to evaluate these various types of foundations for use in specific applications. Specification and interpretation of subsurface investigations will be addressed, and the fundamentals of foundation design methods will be presented. Students will participate in several design examples using the concepts covered in the course.

Instructor: Calvin Y. Yanaga

Session 11 – Foundation Types & Applications

- Typical foundation configurations
- Relationship of structure and foundation types
- Material
- Construction and maintenance considerations
- Evaluating costs

Session 12 – Design Parameters

- Codes and design guides
- Loads and overload factors
- Displacements
- Reliability considerations
- Specifying subsurface investigations for soil data

Session 13 – Foundation Design

- Design guides and standards
- Moment and axially loaded foundations
- Steel reinforcement design
- Computer software
- Foundation testing