

OVERHEAD TRANSMISSION LINE

Engineering Design Course

Sargent & Lundy conducts four-day overhead transmission line design training for utility clients. Engineers specializing in utility transmission line design and engineering present the training onsite at our Chicago office.

WHAT YOU'LL LEARN

This four-day course provides a comprehensive overview of transmission line engineering fundamentals. Each day covers specific tasks relating to line design. For example, in the structure spotting session, participants review the information necessary to perform structure spotting and design a section of line. In the structure types session, participants examine various materials and configurations for transmission structures and evaluate alternate structure types in a project-based case study. Participants will apply the principles learned through design examples and case studies.

Each session incorporates insights from recent experience on a range of projects, including new overhead and underground lines and upgrades to existing lines.

WHO SHOULD ATTEND?

Utility engineers, project managers, and other professionals involved in transmission line projects, as well as entry-level engineers or experienced professionals new to this area of the electric utility industry.

32 PROFESSIONAL DEVELOPMENT HOURS

Participants receive a certificate of completion and one professional development hour (PDH) for every hour of classroom instruction. Refer to specific state requirements for applicable PDH credits.

COURSE FEES

The course fee is \$2,300 per person.

The fee is reduced to \$2,200 if payment is received one week before the course start date. Credit card payments are accepted via PayPal on our website.

The course is also available for utilities seeking an onsite presentation for their employees. A minimum of 18 students is required for exclusive onsite sessions.

Please call for more information and pricing.

FOR INFORMATION CONTACT:

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OVERHEAD TRANSMISSION LINE DESIGN COURSE DETAILS

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

Session 1 introduces power system analysis and factors influencing transmission line design including insulation coordination, sharing rights-of-way, and transmission access. Session 2 provides an overview of underground transmission. Sessions 3 and 4 cover the engineering aspects of selecting a transmission line route. Participants will learn the design criteria for a line and how these criteria affect project costs.

Session 1: Power System Analysis

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

Session 2: Underground Transmission

- High voltage cables
- Underground transmission line design
- Relative costs
- Underground transmission line installation
- Underground transmission line testing
- Underground transmission line limitations

Session 3: Route Selection

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

Session 4: Design Criteria

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

Day 2: Structure Spotting, Conductors, Insulators & Hardware

Session 5 covers the fundamentals of structure spotting, with participants selecting structure locations for a sample line section. Sessions 6, 7, and 8 focus on the characteristics of different conductors and overhead ground wires. The sessions also discuss considerations for selecting types of insulators, including comparisons of the characteristics of porcelain and polymer insulators. Participants will learn the requirements for the various hardware components used on a line and the factors to consider when selecting components for insulator and hardware assemblies.

Session 5: Structure Spotting

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

Session 6: Conductors

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

Session 7: Insulators

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

Session 8: Hardware

- Materials, strength & safety factors
- Testing

Day 3: Transmission Line Structures

Sessions 9, 10, and 11 cover the types of structures used for transmission lines. Participants will learn how to evaluate these structures for applications on specific types of projects, how to develop structure configurations and design loadings, and the fundamentals of structure design. Case studies will illustrate these concepts.

Session 9: Structure Types

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

Session 10: Structure Design Criteria

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

Session 11: 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

Day 4: Foundation Design

Sessions 12, 13, and 14 cover the types of foundations used to support transmission line structures. Participants will learn how to evaluate these foundations for specific applications, as well as how to specify and interpret subsurface investigations and apply foundation design methods. Participants will also complete design examples using the concepts covered in the course.

Session 12: Foundation Types & Applications

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

Session 13: Design Parameters

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

Session 14: Foundation Design

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

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