
ADVANCED TOPICS IN UNDERGROUND DISTRIBUTION (UD)

AGENDA

SESSION 1 – THURSDAY MAY 8th

08:00 a.m. Introduction

- Course objectives, schedule, manual, and format
- Instructor and participant introductions

08:30 a.m. Power Cable System Reliability & Longevity

- Modes & Causes of Failure
- Cable Testing History
- Diagnostic Testing Options

10:00 a.m. Break

10:15 a.m. Ensuring Long-Life Cable Installations

- Cable Life & Reliability
- Cable Total Preventive Maintenance
- Cable life extension methods
 - Fluid injection
 - Thermal loading
 - Overvoltage protection

12:00 Noon Lunch

1:30 p.m. Civil Engineering Considerations in Underground Distribution

- Underground Structure Types and Functions
 - Ducts and Conduits
 - Vaults, Manholes, Handholes and Pads
- Routing Considerations for Underground Lines in an Urban Setting
- Route Survey Elements and Procedures

3:00 p.m. Break

3:15 p.m. Civil Engineering Considerations in Underground Distribution (continued)

- Engineering Testing
- Installation of Cable in UD Structures
- Cable installation exercise

04:30 p.m. End of Day 1

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SESSION 2 – FRIDAY MAY 9th

- 08:00 a.m. Review of Topics and Questions from Session 1**
- 08:15 a.m. UD System Planning and Capital Improvements**
- Key drivers for underground performance improvement
 - System improvement goals
 - System planning
 - Underground line design criteria and standards
 - Prioritizing capital investments
- 09:15 a.m. Professional Practice in Utility Underground Line Design**
- Risk exposures and management strategies
 - Legal and regulatory environment for utilities and engineers
- 10:00 a.m. Break**
- 10:15 a.m. Professional Practice in Utility Underground Line Design (continued)**
- The underground line design process
- 10:45 a.m. Selected Topics**
- Other topics suggested by participants
 - Q & A
- 11:30 a.m. Course Wrap-up**
- Quiz
 - Course Evaluation
- 12:00 Noon End of Course**

Advanced Underground Distribution Systems

LEARNING OBJECTIVES

Upon completion of this course, participants will be able to successfully:

1. Recognize the types and causes of underground cable failure. Describe accepted practices for cable diagnostic testing and failure remediation.
2. Describe cable life-extension methods, including fluid injection, management of thermal loading, and enhanced overvoltage protection.
3. Apply basic civil/structural engineering considerations in the design of underground systems. Describe accepted practices for the design of pad foundations for equipment and for the location/routing/design of underground ducts and conduit systems, including vaults, manholes, and handholes. Calculate cable tensions and other design parameters involved with the installation of cable in duct.
4. Describe key elements of a strategic approach to underground system planning and capital improvements, including the development of comprehensive design/operating criteria, system improvement goals, and prioritization of capital investments.
5. Prepare underground distribution designs using a process that recognizes and manages the risks, regulatory requirements, ethical practices of engineering.