

Both fluid-filled and XLPE high-voltage underground cables are an essential part of many urban transmission systems. While they offer a number of distinct advantages in certain environments they are also expensive to maintain and replace. Adding to these maintenance costs, many fluid-filled installations have been in operation for over half a century, with a great number of these systems being operated outside their original design parameters.

The objective of the Transmission Underground Cables Program (TUC) is to provide a forum for the exchange of information on cable asset management and to establish and promote techniques and tools for improving the management of fluid-filled and XLPE high voltage underground cable systems. The group's present focus is developing a Reference Manual for Transmission Cable Systems, which will include the compilation of best work practices and procedures for the design, maintenance and operation based on utility experience.

Topics & Issues

1. Optimizing Design
2. Life Cycle Asset Management
3. Advanced Diagnostic Test Techniques
4. Maintenance, Operation, and Installation

Technical Advisor



Mr. Steve Haddock is a utility expert in the areas of transmission lines and underground power cables with over 34 years of experience maintaining and managing transmission lines and cables equipment. He began his career at one of the largest electric utilities in North America as a high voltage underground cable splicer, maintaining and splicing cables up to 230 kV. During his time spent as a cable splicer, he attended Ryerson University part time to obtain a Certificate in Electrical Technology – Power Option. Mr. Haddock then progressed through a wide range of positions with increasing levels of responsibility, leading up to becoming the Director of Business Development at a medium sized international utility consulting firm. He is past Chairman of the CEATI Transmission Underground Cable Interest Group (TUCIG) as well as a past member of the Distribution Asset Life Cycle Management (DALCM) and the Overhead Design & Extreme Event Mitigation (TODEM) Interest Groups. He brings a unique blend of experience from field applications to senior level management positions within the electrical utility environment.

Projects

Maintenance of Underground Cable Systems

- Advanced Cable Diagnostic Test Techniques for XLPE, HPFF AND LPFF Cable Systems
- Transmission Spare Cable Strategy: A Laboratory Assessment of Aged Cables Taken from Spare Cables Stored on Cable Reels
- Transmission Cable Reference Manual: Maintenance Chapter
- Maintenance Procedures for Low Pressure Fluid Filled (LPFF), High Pressure Fluid Filled (HPFF), High Pressure Gas Filled (HPGF) and Cross Linked Polyethylene (XLPE) Cable Types
- Submarine Cable Route Maintenance
- Development of Business Cases for Transmission Underground Cable Asset Replacement
- HPFF Joint Casing Corrosion Protection Aging Tests

Asset Management & Condition Assessment of UG Cable Systems

- Review of CEATI Health Index Rating and Weighing System
- Development and Implementation of Asset Management Software for Transmission Underground Cable Systems
- Software to Calculate Cable Health Index
- Partial Discharge Testing for XLPE Cables

Worker and Public Safety

- Manhole Entry Practices and Safety Technology for Crews Working in the Vicinity of Energized Cable Circuits
- Grounding and Bonding in Underground Cable Maintenance Work

Assessment of Available Technologies & Practices for Circuit Rating and Condition Monitoring Systems

- Refinements to Real Time Thermal Rating Systems for Underground Cable Systems
- Acceptable Vibration Limits & Forces Near Underground Cables
- Assessment and Acceptance Criteria for Dissolved Gas Analysis (DGA) Results

Design, Procurement, and Installation for Underground Cable Systems

- Transmission Cable Reference Manual: Installation & Inspection Chapter
- Guide for Factory Production Inspection and Test Plans for Manufacturing and Delivering XLPE Transmission Cable Systems
- Design, Planning and Operations of 500 kV XLPE AC and EHV DC Cable Systems
- Design and Applications of Metal Laminated XLPE Cables

Annual Activities

- 2 Meetings
- Annual Conference
- 5-7 Conference Calls
- On-Demand Information Exchange

*Participation is open to all Electrical Utilities and Independent Power Distributors.
For a complete project listing, please visit www.ceati.com/TUC