Cable Fault Location and Tracing, MV

4.5 Days, 3.6 CEUs

Medium voltage cable systems are the backbone of electrical systems worldwide, yet often they are the most ignored part of the power system – until there is a failure. One of the most important aspects of medium voltage cable maintenance is "fault location." Cable systems today have higher failure rates than ever before due to aging, environmental stresses and improper installation. The ability to efficiently locate faults greatly reduces downtime thus outage costs.

This hands-on course is intended for new or experienced electricians and technicians that install, maintain, repair or troubleshoot 5-35 kV solid dielectric power cables.

Pre-Requisites:

The student should have some field experience and basic knowledge of AC/DC electricity.

Lab and Classroom Attire:

AVO is committed to the personal safety of each participant and requires long pants and ANSI rated "safety toe" work shoes for class and lab activities. Lecture courses may involve a tour of a work or shop area and for this reason open toe shoes and shorts are not considered appropriate attire for the classroom.

Learning Objectives:

Upon completion of this course and lab, the participants will demonstrate by attaining a minimum average grade of 80% (between lab practice and final exam), that he/she is able to:

- Identify medium voltage cable components and causes of failure.
- Utilize safe work practices for cable testing per OSHA and industry consensus standards.
- Trace cable installations with modern cable route tracing and identification equipment.
- Locate secondary faults using earth gradient (sheath fault) technologies.
- Pinpoint faults using magnetic and acoustical tracing system and arc reflection technologies.
- Apply a proven fault locating process; Test, Analyze, Localize.
- Locate faults in a comprehensive cable field lab environment.

SCOPE

Day 1*

I. Introduction

II. Introduction To Power Cable
- A. Purpose of Power Cables
- B. Power Cable Construction
- C. Power Cable Termination
- D. Conditions Causing Cable Faults
- E. Fault Locating Safety

III. Power Cable Identification & Tracing
- A. Safety Precautions
- B. Cable Identification
- C. Tracing Methods and Technology
- D. Direct Coupling Method of Tracing
- E. Signal Tracing Using Integrated Antenna
- F. Modes of Operation for the Receiver

IV. Earth Gradient Fault Location
- A. Safety Precautions
- B. Principles of Operation
- C. Connections and Controls
- D. Basic Operation of Indicator Unit
- E. Setting Adjustments
- F. Locating the Fault

Day 2

V. Cable Fault Location and Tracing Labs
- A. Cable Identification using Cable Identifier Test Set
- B. Cable Test using a 5/10 kV Megohmeter
- C. Cable Tracing using Line Location System
- D. Earth Gradient Cable Fault Location using Earth Fault Locator

Day 3

VI. TDR Cable Fault Location
- A. Safety Precautions
- B. Purpose for Power Cable Fault Location
- C. Principles of Operation
- D. Time Domain Reflectometer (TDR)
- E. TDR Used with the HV Cable Fault Locator
- F. Cable Fault Location Testing
- G. Evaluation of Test Results

VII. Cable Fault Location
- A. Safety Precautions
- B. Purpose for Power Cable Fault Location
- C. Cable Fault Locating Methods
- D. Cable Fault Locating

Day 4

VIII. Cable Fault Locating and Tracing Labs
- A. Cable Fault Pre-locating using Time Domain Reflectometer
- B. EZ Thump Cable Fault Location using Digiphone Acoustic and Magnetic Tracer
- C. Fault Tracing Using Digiphone Acoustical and Magnetic Tracer
- D. Smart-Thump Cable Fault Location using Digiphone Acoustic and Magnetic Tracer

Day 5

IX. Conclusion
- A. Review
- B. Test

*Class scheduling times may vary based on discussions and size of class