Recommended Testing Guidelines

Medium Voltage Cables

Overview

Following is a general guideline for field-testing medium voltage cables. LS Cable & System USA recommends that only qualified personnel, familiar with medium voltage cables and experienced with the test equipment, perform this testing. Please reference IEEE Std 400 IEEE Guide for Field Testing and Evaluation of the Insulation of Shielded Power Cable Systems Rated 5 kV and Above.

Safety

All safety precautions should be followed during testing. All operators performing tests should have read and understand the operating manual for the specific test equipment being used. Particular attention should be given to jobsite safety procedures governing de-energizing, tagging and lock-out before attempting electrical testing.

Securing Area

Barricades should be set up to prevent unauthorized personnel from wandering into the test area. Only authorized personnel necessary to complete the test should be permitted inside the test area.

Test Procedures

In general, there are three types of electrical tests that are performed during the service life of a medium voltage cable.

Installation Testing

This is a field test that is completed after installation but before splicing & termination. This test is performed to detect any possible damage caused while installing the cables.

Acceptance Testing

This test is completed after cables have been installed and all splices and termination have been completed, but before cables have been energized. This test primarily exposes faulty splices and terminations.

Maintenance Testing

This field test is made during the operating life of the cable. The test is conducted to determine the deterioration of the system and to check the serviceability life of the cables. After evaluating the information, appropriate maintenance can be scheduled as necessary.

LS Cable & System USA cables are manufactured to high standards and tested rigorously in order to relieve end users of the burden of pre-installation testing. In normal situations, such testing is not necessary and the cable can be installed, as received, with confidence. However, pre-installation testing should be conducted if the customer specification requires it or if there is evidence of cable mishandling or damage.

Per IEEE Std 400 *IEEE Guide for Field Testing and Evaluation of the Insulation of Shielded Power Cable Systems Rated 5 kV and Above,* the recommended field test procedures for medium voltage cables (extruded dielectric) are:

IEEE 400.2 - *IEEE Guide for Field Testing of Shielded Power Cable Systems Using Very Low Frequency (VLF)(less than 1 Hz)*

IEEE 400.3 - *IEEE Guide for Partial Discharge Testing of Shielded Power Cable Systems in a Field Environment*

IEEE 400.4 - *IEEE Guide for Field Testing of Shielded Power Cable Systems Rated 5 kV and Above with Damped Alternating Current (DAC) Voltage*

Any of the three methods above are acceptable for installation, acceptance and maintenance testing. DC Withstand (Hi-Pot) Testing is not recommended for extruded dielectric cables, particularly for field-aged cables. Past studies have shown that the electrical life of the cable can be greatly reduced due to the additional electrical stresses caused by using a DC Hi-Pot Test. Further information on this subject is available in EPRI Report TR-101245 "Effect of DC Testing on Extruded Cross-Linked Polyethylene Insulated Cables"