

Case Study: Squirrels Cause Unexpected Downtime for Data Center



Quad Plus®



Squirrels led to cable maintenance testing of 15kv cables for a data center.

Objective

- Diagnose unexpected cable failure and make repairs.

Solutions

- A visual inspection revealed clear disintegration of terminations.
- Performed VLF withstand and Tan Delta testing to check cable integrity.
- Replaced compromised cable terminations found during Tan Delta testing.
- Retested cable to ensure adherence to NETA MTS-2023 standards for 15kV cables.

Results/Benefits

- The source of the unexpected downtime was found and corrected quickly.
- The data center could return to full operating capacity immediately.
- The customer received a full report of the fault investigation and our findings from the VLF and Tan Delta tests.
- We advised the customer that these cables should be tested every 36 months, according to NETA MTS-2023.

Background

The Quad Plus team arrived to perform cable maintenance testing for this data center customer who was experiencing unexpected downtime. The Data Center has two main transformers that feed the building outside the facility, so one will be operational while the other is down. In the event of a failure of the second transformer, the entire building would lose power, causing the customer to lose money for every second of downtime.

A visual inspection revealed clear disintegration of the terminations, likely due to a squirrel infestation. The B and C phases of the cable terminations had one-quarter of their width remaining and could snap at any moment while under voltage. The technicians determined that a VLF withstand test and Tan Delta testing were necessary to determine the integrity of the 15kV cable.

The technicians would run the tests to obtain a baseline before making repairs, then again after to verify that the cable could not hold power and that repairs were made properly.

Quad Plus Solution

The most basic use of the VLF is to perform a go/no-go withstand test to expose defects that cannot hold the test voltage. If a cable cannot hold around 1.5 to 3 times the normal voltage (depending on the cable class), it's important to discover this before a failure occurs. VLF is the best choice in this case, as any defect severe enough to be driven to partial discharge is brought to failure. Lesser defects and good insulation remain dormant under the overvoltage stress and are not affected.

In this case, the 15kV cable's insulation was intact. A Tan Delta test revealed terminations that started to show signs of failure at half the required voltage capacity of the cables and needed to be replaced immediately.

Following the repair, technicians ran the tests again to ensure the terminations were installed correctly and the cable could withstand the necessary load according to the NETA MTS 2023 standard for 15kV cables. The customer was provided with a detailed report containing our test results and repair details, and we advised the customer that Medium Voltage Cable Testing is recommended every 36 months according to NETA MTS-2023.