Exacter Technology Pinpoints Failing Power Equipment

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The ever-increasing demand on electric utilities to deliver more consistent, reliable power has led providers to use data for finding new ways of mitigating outages.

Such changes in customer expectation, along with a shift in regulatory focus, calls for power providers to change the way they analyze outage information.

A recent analysis of data from two large North American electric suppliers by Davey Resource Group, a division of The Davey Tree Expert Company, determined that during a five-year period trees and vegetation not surprisingly accounted for the lion's share, 20 percent, of customer minutes of interruption (CMI).

The second largest cause of CMI is equipment failure. During that same time period, equipment failures accounted for 17 percent of CMI (more than 1.1 million hours) and more than 30 percent of total outages, whereas vegetation accounted for 20 percent of outages.

Davey combines data analysis and field research to provide a clear direction of how to improve reliability. Through use of a new field analytics tool, Exacter Technology, Davey gives utilities the capability to substantially reduce the percentage of CMI caused by equipment failure. The Exacter Technology pinpoints radio frequency interference (RFI) to proactively repair or replace equipment before an outage.

Damaged or failing insulators, capacitors, lightning arrestors and other components exhibit signs of weakness long before giving out and causing an interruption. Using Exacter's patented technology, Davey can patrol circuits to uncover equipment giving off these "invisible" signs of deterioration.

After patrolling a circuit, Davey can identify for utilities precisely the equipment in need of replacement. Data is provided via GIS mapping and photos from various perspectives of the location. Utilities can then use these vision analytics to get a true picture of their grid's health, identify strategic opportunities and create a plan for improving grid performance and grid health.

Davey is capable of inspecting hundreds of miles of overhead lines and mapping out failing equipment along the system in a matter of weeks.

When dealing with weather events, utilities can use the data to strengthen weak points in the system ahead of storms so they can better withstand wind and other related damage. The Exacter data can also show utilities a comparison of weak points in a system before and after storms. That knowledge lets utilities associate costs directly related to a storm event, and the information also decisively determines proper construction during storm restoration.

For drought-ravaged areas, the Exacter analysis also has the potential to prevent wildfires sparked by mechanical failures.

Exacter Technology identifies specific internal defects inside equipment and contamination build-up of dirt and debris on insulators. Either problem can lead to flashover and a pole fire. In the West and Southwest, this type of equipment failure also can easily ignite nearby dry vegetation and cause a wildfire. Having this information before a flash over can be the difference maker in preventing a fire.

One key success element so far in using Exacter has been its ability to identify failing transmission components whose deterioration is virtually invisible during a visual inspection. Several early pilot programs have shown the majority, more than 95 percent, of electrical equipment identified by Exacter as failing were not detectable by visual inspection—results validated in an independent study of degraded, contaminated or failed components.

Davey helps utilities prioritize critical maintenance by identifying the exact location of failing equipment. Using connectivity data, Davey can provide a customer-impact score to allow utilities to more effectively prioritize repairs.

Such predictive maintenance guided by Exacter Technology is a key to driving long-term reliability improvement in an environment where electric utility customers expect zero down time.