

# Pickwick Uses DFA Technology to Predict, Prevent Vegetation Outage

Pickwick Electric Cooperative (PEC, Selmer, TN) used DFA technology to avoid an impending outage from tree encroachment in an overhead line. The DFA system discovered the problem, based solely on substation-based current and voltage waveforms, coupled with intelligent, on-line algorithms. It provided location information that enabled PEC to find and eliminate the encroachment before it caused a permanent outage. PEC had no other indication that a problem existed.

During a recent rainy period, the DFA detected, characterized, and reported a fault and the resulting momentary operation of a single-phase line recloser. DFA performed these functions through on-line analysis of electrical waveforms measured from CTs and PTs at the substation.

The line recloser interrupted part of the feeder's customers and then restored service a few seconds later. No customers experienced a sustained outage and no one reported the "blink" to PEC. The line recloser was located at a remote point on the feeder and did not have the capability of reporting the operation. Because the line recloser automatically cleared the fault and maintained service to all customers, this type of event typically would not be of special interest to a utility. In this particular case, however, it was not an isolated event. Similar faults and momentary interruptions occurred a total of four times over a two-day period. Each event momentarily interrupted the same customers, but in each case, the line recloser maintained service after a single momentary interruption. Further, there were no customer complaints. As a result, PEC had no indication that a problem existed, except from the DFA system.

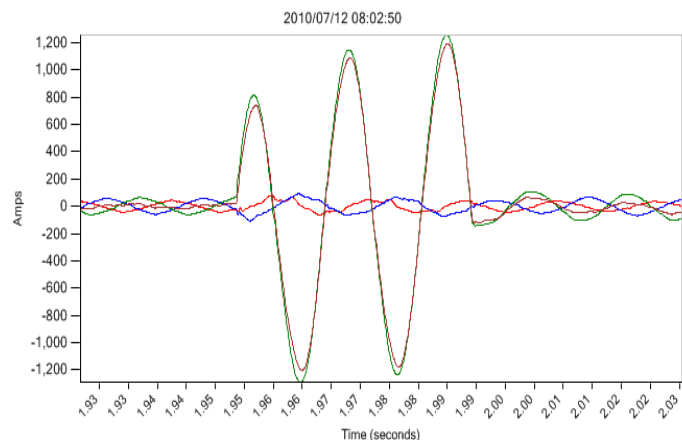


The DFA system characterized each of the four individual faults and momentary interruptions. It then sifted through all other feeder activity, automatically, and highlighted these four events as a possible recurrent fault condition. It provided the characteristics of each individual event, plus valuable location information that enabled PEC to search only a specific area and find the encroachment a few hours after the fourth event. Targeted tree trimming resolved the problem, with no customer ever experiencing a sustained outage or making a complaint to PEC.

John Bowers, VP of Operations for PEC, remarks, "We have been involved with DFA for a long time. It alerts us to failures before customers experience problems, and we have avoided multiple outages with it. It is a unique technology and we look forward to continued success with it."

## About DFA Technology

Distribution Fault Anticipation (DFA) technology was developed at Texas A&M University as the result of analysis and characterization of thousands of high-fidelity electrical current and voltage waveforms. Researchers created this database of waveforms with extensive support by EPRI and more than a dozen utilities, which installed high-fidelity, high-capacity data-recording devices in their substations and connected CTs and PTs as inputs. Sensitive triggered waveforms were recorded over multiple years, to produce a database that documents the electrical waveform signatures of numerous failure modes and incipient-failure modes of line apparatus, enabling researchers to develop sophisticated, on-line algorithms to alert utilities about failures, sometimes even before they result in outages. The DFA system performs autonomously, to deliver actionable information without requiring human experts to analyze and interpret raw data.



## For More Information

For more information about DFA technology, please contact Dr. B. Don Russell, Regents Professor (979-845-7912, [bdRussell@tamu.edu](mailto:bdRussell@tamu.edu)), or Mr. Carl Benner, Senior Research Engineer (979-845-6224, [carl.benner@tamu.edu](mailto:carl.benner@tamu.edu)) at Texas A&M University. For more information about Pickwick Electric Cooperative's experience with DFA, please contact Mr. John Bowers, VP of Operations (731-646-3766, [jbowers@pickwick-electric.com](mailto:jbowers@pickwick-electric.com)).