

CASE STUDY

Enabling Proactive Equipment Maintenance with Advanced Power Quality Monitoring

The Challenge

Power system infrastructure continues to age and evolve on both sides of the meter. As gaps emerge between legacy systems and emerging technologies, power quality must be closely monitored for signs of equipment irregularities, damage and potential failure at various points within utility, commercial and industrial assets.

A major investor-owned utility faced this challenge head on while monitoring power quality across multiples sites of essential infrastructure. The critical load facilities — including large processing plants, commercial complexes and multiple data centers — require continuous high quality power, or otherwise face costly outages and customer downtime.

The utility needed to proactively monitor and analyze power quality data to highlight and prevent potential catastrophic failures. Unfortunately, traditional metering equipment fell short in capturing subtle yet impactful anomalies, as well as power quality data analysis. These deficits made it futile for the metering equipment to address potential power quality issues before they escalated.

The focus turned to investigating an enterprise-wide approach to uncovering actionable power quality insights from across the fleet. Because upstream events often cause downstream impacts, a holistic view would better pinpoint the improvements needed to strengthen system reliability and resiliency as a whole.

Challenge

Equipment failure prevention

Project Type

Enabling power quality anomaly detection

Equipment

PQube® 3 power quality analyzers and QubeScan monitoring software

The Solution

To tackle this challenge, the utility deployed Powerside PQube® 3 power quality analyzers at critical points, including at voltage transformers at mission-critical facilities. To increase visibility into power quality, the utility integrated the PQube 3 analyzers with QubeScan monitoring software. Doing so vastly improved comprehensive analysis and reporting capabilities.

The utility then used the PQube 3 high frequency (HF) impulse event trigger to develop a mechanism to detect probable equipment failure — noting the rapid recurrence of the event triggers to identify potential issues.

The PQube 3 samples waveforms at an unprecedented rate — up to 4MHz — making it possible to identify voltage anomalies that would otherwise be invisible to traditional metering equipment.

The Results

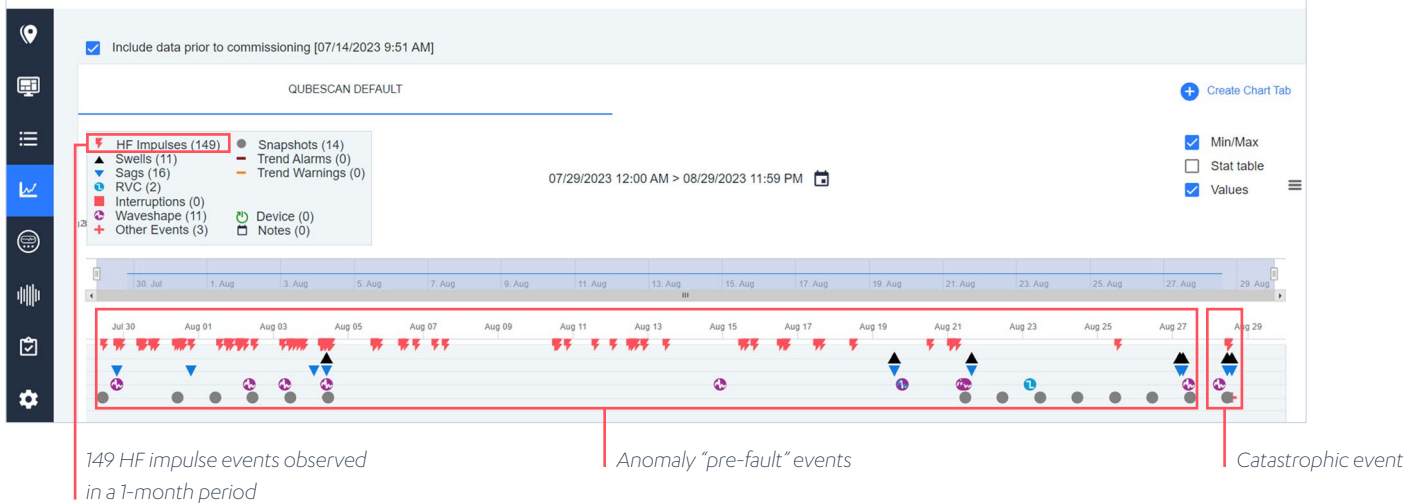
The PQube 3 and QubeScan proved their value when they alerted the utility of a significant measurement point issue where 149 HF impulse events were observed within a month. This high concentration of events was classified as a possible equipment pre-fault condition.

Though a catastrophic failure on a voltage transformer had already occurred due to the recurring HF impulse event behavior, the utility used the QubeScan data to recognize similar patterns across their equipment. By triggering proactive maintenance — including the timely replacement of similar transformer equipment — **QubeScan helped the utility prevent future equipment malfunctions, damage and failures.**

The broader deployment of accurate PQube 3 power quality analyzers, combined with the powerful cloud-based analysis of QubeScan, significantly increased the utility's access to power quality data across each site they supply power to. **With this remote visibility, users were now empowered to get ahead of issues in real time.**

Ultimately, by leveraging QubeScan's tailored analytics and rapid response capabilities, the utility's engineers can conduct quicker root-cause analyses. Such real-time monitoring minimizes downtime, reduces costs and improves overall system reliability.

Figure 1: High-frequency (HF) impulse "pre-fault" events and a catastrophic failure



Seamlessly monitor the power quality data of your entire enterprise. Learn more about PQube 3 and QubeScan monitoring software today.

Discover QubeScan