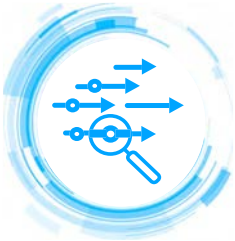
Predictive utility equipment maintenance

Using sensor data, AI and advanced analytics to predict and mitigate equipment failures before service interruptions occur



Mobile sensors continuously capture condition-based data of distribution assets over time.

Apply AI and analytics to pinpoint and predict asset failures.

Prioritize maintenance to maximize uptime and employee safety.

The Issue

Equipment failures cost utilities millions annually – and each year, they are the root cause of nearly one-third of customer interruptions. These outages not only leave utility customers without electricity, but also represent significant repair costs and risks to the employees performing these repairs.

Until now, utilities have had limited ways of anticipating and mitigating these equipment-related issues, leaving electric utilities with few alternatives other than to wait for equipment to degrade to the point of failure. Even existing asset performance management (APM) approaches do not always predict equipment failures or help utilities best direct their resources because they only focus on voltage and sensor data.

To address these issues, what's needed is state-of-the-art sensing technology that can pinpoint and predict equipment failures before they cause service interruptions – all without altering the grid in any physical way. Imagine no need to send linemen out, no service disruptions, no safety issues, and no additional equipment needed.

The Challenge

High cost. Unplanned repairs cost utilities millions of dollars in equipment, overtime and other expenses annually, as well as revenue penalties in areas with performance-based regulations. SAS® vastly reduces these costs by shifting from unplanned to planned maintenance.

Blind spots in distribution equipment health. Current inspection technologies can't detect equipment prefailure radio frequency signatures at scale, and costly remote monitors and line post sensors can't detect partial discharges indicating degraded components. SAS eliminates these blind spots with automated, continuous condition-based assessment.

Delayed discovery. Current techniques often miss issues until significant degradation or failures occur, resulting in high overtime costs, safety risks and longer power outages. SAS provides predictive insights to prevent failures.

Difficulty prioritizing. Once degraded equipment is identified, utilities struggle to determine which equipment to prioritize for repair. SAS Analytics prioritizes issue corrections for maximum impact.

Analytical limitations. With limited access to data science expertise and sparse partial discharge data, utilities have few insights into infrastructure integrity. SAS puts timely insights at users' fingertips.

Our Approach

SAS and its partner, Exacter, enable you to achieve next-level reliability and service levels by complementing your existing APM approach with edge-computing sensing technology and advanced analytics focused on RF emissions from equipment. Analyzing these emissions using AI and machine learning enables you to better understand the types of equipment failures most likely to occur and how to prioritize maintenance plans for safety, reliability and uptime.

We approach the problem by providing software and services that enable:

- Accurate, reliable detection of degraded equipment without utilities having to install new sensors.
- Data management and data quality tools to prepare data needed to generate insights.
- Insights that enable repair and maintenance that can preempt unplanned loss of service, collateral damage to equipment and added safety risk to workers.
- Optional integration with existing work order systems to minimize disruption to existing processes.

The results include shorter and less frequent customer interruptions, reduced restoration costs, safer work environments and improved customer satisfaction.

The SAS® Difference

SAS leverages existing utility infrastructure, novel sensing technologies and enhanced analytical capabilities to accurately anticipate equipment failures well in advance. Our software and services help utilities:

- **Reduce operations and maintenance expenditures** – by reducing interruptions and allowing utilities to act faster and earlier to infrastructure issues. SAS automatically associates collected data with relevant assets while sensors are on the move, increasing throughput and saving time and money.
- **Improve reliability metrics and resource allocations** – by understanding where power delivery system weaknesses are and directing capital expenditures where they will have the biggest impact. This helps prevent outages; improve SAIFI, SAIDI and CAIDI values; and reduce risks of reportable OSHA events.
- **Reduce interruptions and improve customer satisfaction** – using advanced analytics that helps utilities anticipate degradation and make repairs before service interruptions occur.
- **Eliminate equipment and systems for utilities to manage** – because Exacter handles data collection by installing its sensors on fleet vehicles traversing the target geography. Utilities don't need to install additional equipment to enable automated, efficient monitoring of component degradation.

DIRECT BENEFITS

38%
Reduction in hazard rate for injuries and fatalities.

33%
Reduction in crew cost for overtime.

18%
Reduction in crew time restoring outages.

Learn more about SAS's data-driven grid reliability capabilities.