



› Solution Brief

Business Impact

“Predictive forecasting has long been the goal for reliability engineers and others responsible for managing asset performance. Until recently, it has been an elusive goal due to technology limitations and project costs.”

Using Advanced Analytics to Predict Equipment Failure,
Leif Eriksen and
Kristian Steenstrup,
Gartner, Inc.,
May 29, 2015



Challenges

- **Understanding failures.** If you don't know which events or processes cause outages – and why – you can't predict or avoid them.
- **Expanding grid visibility.** With the separation and disconnect between asset views, it's hard to integrate all relevant data to help you make informed decisions and communicate effectively with stakeholders.
- **Analyzing asset performance data.** It's hard to comprehensively improve performance unless you can fully use all of your rich, dispersed data.
- **Optimizing maintenance.** Resources and costs are used inefficiently when you cannot predict maintenance cycles.

Improve Grid Reliability With Predictive Analytics

The Issue

Faced with an aging infrastructure and new sensor data, utilities are under pressure to optimize asset replacement costs, improve operating efficiencies, maintain strict budget control, and meet regulatory requirements for adopting renewable and smart grid technologies. Even as they invest heavily in maintenance and repairs, “an analysis of utility generation, transmission and distribution assets suggests opportunity exists to improve the efficiency of the grid and the utilization of its assets”.¹

Utilities are continuing to invest in new sensor technologies that, with the right big data strategy, enable them to move from a reactive or condition-monitoring mode to a predictive planning mode. Addressing service needs as they occur rather than proactively anticipating them ends up costing more in the long run – in terms of personnel, equipment and customer satisfaction. It also has an adverse effect on customer satisfaction and reliability indices.

Our Approach

With predictive asset analytics, utilities can proactively mitigate events that cause outages and run assets at peak performance. SAS provides software and services to help utilities:

- **Improve asset performance** by predicting and planning for problems before they escalate to cause unexpected shutdowns.
- **Reduce prolonged outages** to enhance your reputation with customers and regulatory agencies.
- **Strengthen compliance** by avoiding health, safety or environmental violations and the resulting financial penalties.
- **Gain a contextual view of asset health** by performing comparative analysis of KPIs to break down data silos and incorporate best practices from around the organization.
- **Optimize costs** by identifying and addressing issues sooner, from routine equipment maintenance to workforce planning.

With state-of-the-art analytical modeling, visualization and alert-initiated workflows, SAS helps you align performance strategies and close the gap between target and actual performance of reliability metrics.

¹ DOE/NETL - 430.01.03. Electric Power System Asset Optimization. March 7, 2011, Page 9.

The SAS® Difference:

Optimize costs and avoid disruptions with predictive asset analytics

SAS helps utilities harness the power of big data from highly instrumented assets. With SAS, you can:

- **Predict future maintenance needs for critical assets.** SAS offers a comprehensive library of descriptive and predictive models that address a wide variety of data sources using a high-performance engine enabled to handle high data volumes.
- **Get a single source of insights for grid assets.** We have extensive experience working with and integrating data, including unstructured text data, from maintenance records and leading asset management vendors, GIS, ERP vendors and historians.
- **Gain a holistic view of asset performance.** SAS gives users a complete predictive analytics solution encompassing data management, analysis, visualization and reporting with the ability to model down to individual assets.
- **Develop customized predictive models in-house more quickly.** With machine learning and rapid GUI-driven modeling capabilities, SAS enables analysts to respond to changes in the asset infrastructure without engaging expensive external resources.
- **Ensure continuity and process documentation.** SAS helps utilities collect and capitalize on the knowledge of their aging workforce by enabling them to document effective processes that ensure system maintenance and performance continuity.

Case Study:

Electric Transmission and Distribution Utility

Situation

A US-based transmission and distribution company wanted to use analytics to improve electric reliability and operational performance for its 2.5 million metered customers. It had expended significant resources for transformer repairs, and wanted to know how to improve. The transformers did not have intelligent sensors, but the company had secondary data from which to build predictive models – including load profile, physical characteristics, associated meters, weather, geospatial locations and previous outages. Even with very little data to analyze, the company believed it could build a predictive model based on all available data related to the “dumb” transformers.

Solution

SAS smart grid analytics identified the critical factors driving transformer failures. These models were four times more accurate than current analyses – enabling the utility to improve system reliability through proactive transformer replacement and maintenance.

Results

Using the analytical methodologies developed through this project, the company:

- Improved methods of anticipating transformer overloads.
- Enhanced regular equipment maintenance schedules.
- Reduced repair truck rolls for unscheduled maintenance except during unplanned incidents like storms.

What if you could ...

Optimize cost performance

What if you could optimize both man-hours and maintenance costs by pinpointing problems more accurately and aligning resources more effectively?

Monitor and measure the health of the entire system

What if you could overcome barriers imposed by siloed operational systems and gain true visibility into asset performance and business impact?

Pinpoint exact causes

What if you could identify the root cause of asset performance issues by applying advanced analytics to data, in motion or at rest?

Anticipate future events

What if you could predict events that cause outages?

You can. SAS gives you THE POWER TO KNOW®.

SAS Facts

- SAS helps customers at more than 75,000 sites improve performance and deliver value by making better decisions faster.
- SAS works with more than 250 utility customers worldwide and 100 percent of the US Fortune Global 500® Utilities.
- Gartner positions SAS as a **Leader in the Magic Quadrant for Advanced Analytics Platforms**.¹

¹ Gartner, Magic Quadrant for Advanced Analytics Platforms, Gareth Herschel, Alexander Linden, Lisa Kart, 19 February 2015. Gartner does not endorse any vendor, product or service depicted in its research publications, and does not advise technology users to select only those vendors with the highest ratings or other designation. Gartner research publications consist of the opinions of Gartner's research organization and should not be construed as statements of fact. Gartner disclaims all warranties, expressed or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.

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