



# SIEMENS

*Ingenuity for life*

## Case Study

# Drive Train Analytics

Siemens digital services help utility preserve equipment reliability to meet increasing customer demand.

[usa.siemens.com/services](https://usa.siemens.com/services)

Across America, many utilities depend on fossil-fueled power stations built in the last century to provide reliable power for their customers. One such power station, located in the Mid-Atlantic, opened in the 1960s and today supplies electricity to over 4 million customers of its parent utility.

To satisfy customer expectations for reliable electricity production, this utility's plant management team was interested in a solution using data-driven intelligence for their critical variable frequency drives (VFDs) and motor assets. Their objective was to produce advance warning of system compromise to minimize downtime associated with an in-person equipment inspection and/or a complete failure. Siemens delivered an innovative, cloud-based, analytic and diagnostic services program to monitor equipment health and provide predictive insights into system performance.

### Customer Challenge

To stay competitive in their market, the utility worked with Siemens to modernize their operations by installing new SINAMICS Perfect Harmony GH180 VFDs on key boiler-fan motors that help keep the coal-fired generation units operating.

The SINAMICS drives play a critical role in the power station's ability to generate power. The drives need to run safely and reliably – often for decades and under harsh conditions. In the course of normal operation, these drives become subject to extreme wear and tear, creating a potential risk of failure and unplanned production downtime. For the power station, any unscheduled drive outage equals significant loss. Even a small part failure can result in costly unplanned downtime.

### Benefits

- Accelerated troubleshooting and earlier countermeasures
- Maximum drive performance
- Higher plant availability and reliability
- Optimized scheduling of maintenance and service activities
- Cloud-based data analysis
- Automated status reports with historical trend data collection
- Real-time monitoring and evaluation by certified Siemens experts

# 80% reduction in break/fix response time with Drive Train Analytics

The ability to prevent drive failure is recognized as critical to maintaining availability, reliability, and achieving operating goals. In their current environment, plant maintenance reacted to faults after an event. Diagnosis and fault clearance required operators to manually generate data and relay it to remote experts to begin troubleshooting.

The process was both time consuming and costly – both from an emergency repairs standpoint as well as lost production. Most repairs take hours and more significant repairs could require the station to purchase electricity from the market in order to meet their customer demand. This affected their bottom-line and became the driver for utility operators to detect drive wear and tear sooner.

## Siemens Solutions

Drive Train Analytics from Siemens Industry Services provides a measurable improvement over the utility's current reactive maintenance strategy. Using "real-time" condition-based monitoring and data analysis for early detection of drive-wear, it identifies impending damage and schedules maintenance before major issues occur.

Drive Train Analytics securely and continuously transmits critical performance data from the drives. This data is accessed by Siemens expert analysts and used to monitor and assess the drives' health and performance. Real-time status of the drives is tracked and recorded. If a fault occurs, informed diagnostic troubleshooting can begin immediately.

Using advanced analytical tools, Siemens experts compare the current drive data to optimal state. When it falls outside of the plant's acceptable range, analysts provide recommendations to the utility. In the event of an unexpected interruption, an alert is issued for Siemens and the plant to mobilize under a rapid response plan.

Implementing the new service began by connecting the SINAMICS Perfect Harmony GH180 VFDs with MindSphere, Siemens cloud-based, open IoT operating system. A MindConnect device – a hardened Siemens SIMATIC Nanobox industrial PC – was installed to create a direct and secure connection between the drives and MindSphere. MindSphere provides state-of-the-art security during data acquisition in the field, transmission, and storage

in the cloud. The security framework of MindSphere is aligned to the principles of industry standards (IEC 62443, ISO/IEC 2700) and governmental recommendations for data handling in cloud environments.

## Results

With Siemens Drive Train Analytics, the utility saved nearly \$120,000 in operating expenses in the first year. Operators at the power station receive a continuous picture of drive performance anywhere with an Internet connection via a web-based dashboard. Using data and predictive indicators, operators were alerted to the faults sooner, began diagnosis faster, and resolved the events in significantly less time – 75 minutes versus an average of 6 to 7 hours. This reduction of Mean Time To Repair (MTTR) has been proven to significantly increase the overall availability of drives. The associated improvement in machine Mean Time Between Failure (MTBF) is another positive feature of the service.

Siemens experts supplement on-site staff by providing regular insights on drive performance and being available around-the-clock to help assess unplanned issues. The utility benefits from the added knowledge of equipment experts and gains peace of mind from having additional resources monitoring the drives that are critical to its success in a competitive energy market.



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