

CUSTOMER CASE STUDY

The power of communication: How Kansai used the PI System™ to transform its power plants

Kansai - www.kepco.co.jp
Industry - Power Generation

Challenge

- Kansai needed to operate more efficiently while adding new customer services

Solution

- The company brought all nine of the company's power plants into the PI System, created digital twins of equipment with Asset Framework

Result

- Savings of \$3 million a year in one plant alone; launching of Value Creation Services program for customers

The Japanese power industry was forever transformed by the Fukushima earthquake. The 2011 disaster, in which a tsunami disabled the power supply and cooling system at the Fukushima Daiichi nuclear power plant, resulted in one of the worst nuclear meltdowns since Chernobyl. It prompted the Japanese government to pass extensive energy reform laws and shutter most of its nuclear power plants. Reform brought liberalization to the nation's electrical market. For the Kansai Electric Power Company, Japan's second-largest power producer, national energy reform brought new challenges as well as new opportunities. Kansai, which had had a regional monopoly, now was competing in a new \$200 billion market. To stay competitive, Kansai would have to optimize production. To draw in new customers, it would need to create new value-added services. The key to all these efforts was harnessing data across the enterprise. Kansai turned to the PI System to make it happen.

A rapid PI System deployment across power plants

Energy reform reshaped Japan's utility markets in 2016. That year, Kansai began an initial trial of the PI System at three of its nine plants. The goal of the PI System project was to use real-time operations data to improve operations, maximize resource availability, and optimize maintenance practices across the company.

The project moved fast. By 2017, Kansai was ready to roll out the PI System to all nine of its power plants. Key to this achievement was receiving help from internal teams that created context-rich models for operations data and trained Kansai operators on how to use the system. Kansai also set up an information-sharing site about the PI System to communicate best practices across all the plants.

Real-time insights for real-time decisions

Access to real-time data across all plants opened up a new world of operational insights for Kansai. Among the improvements made possible by the PI System project were reduced boiler failures, the leading cause of downtime in steam power plants. Using real-time data allowed Kansai to detect leaks earlier and determine optimal repair periods.

The PI System also enabled improved gas turbine availability. A slow turbine can lead to a plant shutdown. By monitoring vane data with the PI System and comparing it to historical data, Kansai can detect abnormalities in gas turbines in real time and respond quickly.

Another benefit is optimized boiler performance. Intuitive dashboards in PI Vision allow operators to visualize boilers and identify the causes of inefficiency through heat-balance analysis. In addition, spray water-injection control in heat-recovery steam generators is improved. Real-time visualizations of water operations allow for fine-tuning by operators.

Finally, real-time data is enabling a shift from scheduled maintenance to condition-based maintenance at Kansai, saving time and resources, avoiding more failures, and helping the company estimate and prepare for equipment end of life.

Operational improvements driven by PI System data have improved plant performance, reduced unplanned downtime, cut costs, and improved process quality. Kansai estimates that operational improvements have saved \$3 million a year at one plant alone.

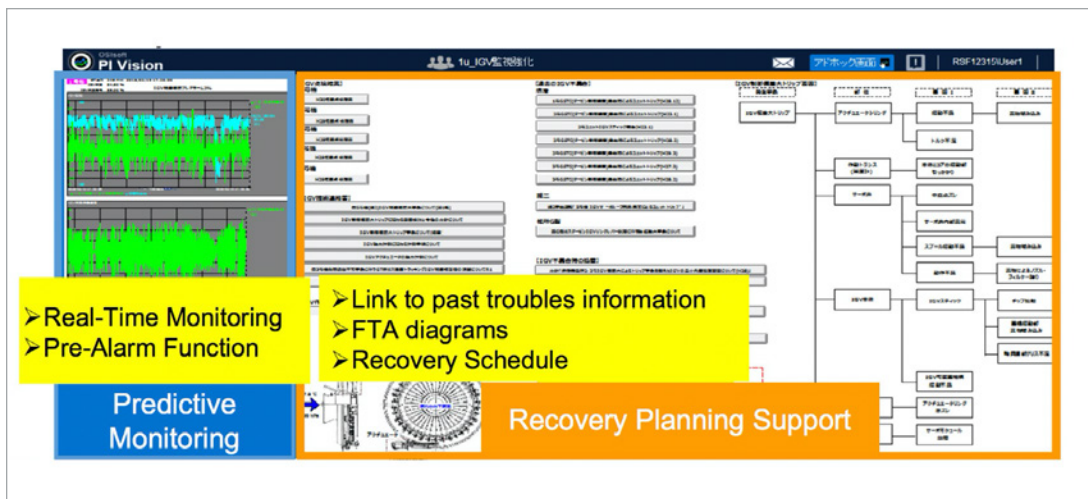
The K-VaCS program: A new level of customer service

Improving operations was just the first part of Kansai's digital transformation journey. The next step was to harness the best practices achieved through better use of data. Kansai then made them available to the company's power plant customers through the Kansai Value Creation Services program, or K-VaCS.

"The PI System, which enables the collection, storage, and visualization of enormous amounts of data, is an essential data-management system for our solution."

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Tadahiro Nakazawa,
Manager, Technology Development Group,
Thermal Power Division, Kansai



Kansai uses PI Vision for real-time operational monitoring and process optimization at its power plants.

Kansai is collaborating with power producers under the K-VaCS program to improve the efficiency of their thermal power plants using real-time data. The program provides services and technology that allow customers to detect system abnormalities, reduce downtime, and improve operations for utilities and others in the electric-power supply chain. The Bluewaters Power Station in Australia, an early customer of Kansai's K-VaCS program, is using remote monitoring to trim operations and maintenance costs through improved efficiency and reduced downtime.

Kansai has also developed an AI-enabled digital twin of its coal-fired operations. By combining that model with sensor data from the PI System, the company is able to identify best practices for coal power plants in order to help other power producers improve their operations.

Using insights from data, Kansai is gaining deeper understanding of operational performance and equipment health. It's also empowering the company's own workers, as well as its customers, to operate more efficiently in a newly competitive market.

For more information about Kansai and the PI System, [watch the full presentation here](#).