



CUSTOMER CASE STUDY

Vattenfall discovers new efficiencies in condition-based maintenance

Vattenfall - <https://group.vattenfall.com>
 Industry - Power generation, hydroelectric

Goal

- Address maintenance issues before they become costly problems

Challenge

- Real-time monitoring of more than 25 assets located across Sweden

Result

- A monitoring system that alerts employees via email and text message when potential issues arise

Solution

- The PI System™

Vattenfall Hydro Power needed a way to reduce unplanned maintenance and allow its employees to troubleshoot issues promptly. Representing more than 50% of energy production in Sweden, Vattenfall Hydro Power is the backbone of Sweden's energy system and the third-largest hydropower provider in Europe. The utility manages 55 large-scale power plants and about 50 smaller-scale plants in Sweden and Finland with an annual production of 30-35 TWh and a capacity of about 8.300 MW. The PI System™ allowed the company to do both and reduce its overall maintenance costs by 1.5% in the first year alone.

Ambitious goals, rapid implementation

In 2013, Vattenfall's management recognized that the company had to change its approach to asset maintenance. "We've used condition-based monitoring for the last 15 to 20 years, but we've relied on an old system that uses static data based on periodic inspections, tests, and a data historian," said Magnus Holmbolm, maintenance development engineer at Vattenfall. "We ended up using a lot of reactive maintenance practices. We needed to move forward in an instrumented way to real-time condition-based monitoring to improve our efficiency and reduce our cost of operations."

Since the management team had some experience using the PI System, they decided to evaluate if it could replace the existing system, support this new maintenance strategy, and add value by integrating with other existing systems for the planned Hydro Information Portal.

In April 2014, a six-person product team began setting up the PI System in a pilot project. "Our colleagues in Germany came up for a week to teach us how to set up the PI System and it seemed very intuitive, so we adopted it very quickly," Holmbolm said. The pilot system was fully secured using SSL for web apps and firewalls. The team used PI ProcessBook®, PI Manual Logger™, and web clients in PI Coresight™. The PI System also worked on tablets via a remote logon solution with two-factor authentication.

"With the new system, we're starting to perform trend analytics on about 25 basic conditions on each unit," said Holmbolm. "We're using templates in Asset Framework to perform trend analysis of single values and then create new elements from those templates to capture a trend. It's very easy to use."

Reducing complexity, increasing value, and preparing for the future

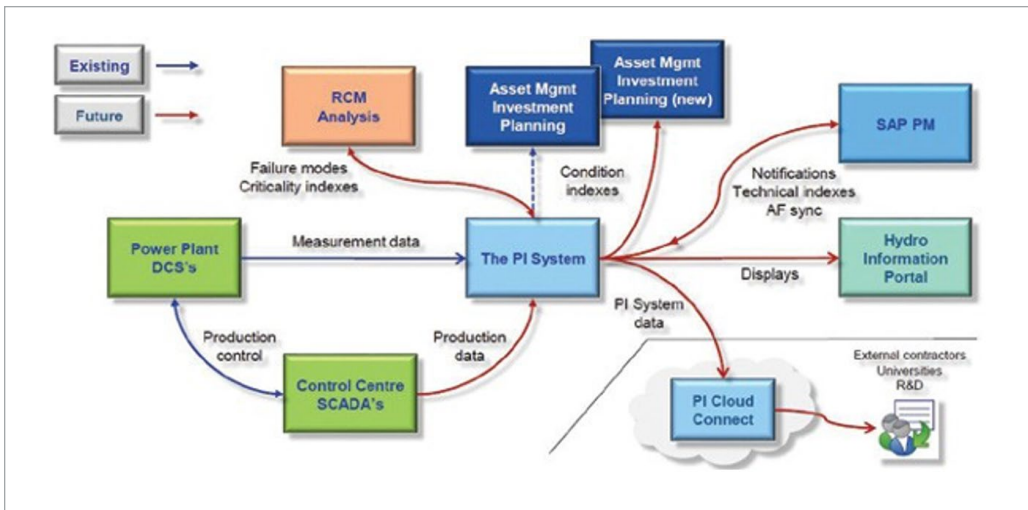
Thanks to the PI System, the Vattenfall team can now perform on-demand trend analysis and give plant operators a quick overview of conditions across the system. The system uses a simple traffic light representation from five (green) to one (red). If a value goes above four, the system notifies users via email. "I can use Asset Framework to perform trend analysis by getting the highest value out of all of these readings and then do an analysis on that value instead of doing hundreds of calculations on each value inside a population," said Holmbolm.

The team can now to move into more failure-mode analysis and address an issue's root cause before it escalates into a full-blown crisis. "We choose one subsystem, see what components are part of it, and we can see what kind of maintenance activities we have today," said Holmbolm. "We can find a failure before it occurs, and then we can have a planned maintenance activity instead of an unplanned one."

"The benefit is that we can find a failure before it occurs, and then we can have a planned maintenance activity instead of an unplanned one."

- **Magnus Holmbolm,**

Maintenance Development Engineer, Vattenfall



Vattenfall uses Asset Framework to monitor its power plant assets and alert users when issues arise.

As a replacement for the Conwide system, the PI System met Vattenfall's maintenance and safety needs and offered more stable data capture. Plus, the PI System has a richer analysis functionality and highly flexible integration capabilities, including the ability to support a future Hydro Information Portal that would make process data, analyses, and KPIs available in real time. "We concluded that the PI System could replace our old system and fulfill our requirements as we move into this new maintenance strategy," said Holmbom.

By minimizing unplanned maintenance events, the PI System also reduced total maintenance costs by at least 1.5%, while improving the continuous monitoring capabilities of each hydropower plant and increasing the accuracy of each plant's equipment. Holmbom concluded his presentation by saying, "We don't feel like we're buying a function; we're buying the infrastructure we need to grow in the future."

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