AVEVA

AGL enables real-time data access and predictive modeling with the PI System™

AGL - www.agl.com.au
Industry - Transmission and distribution
Partners - SAP, RtTech, J5, ECG

Highlights

- Enabled $18.7 million AUD in avoided losses in three years

- Avoided a catastrophic shutdown that would have cost $50-$70 million AUD

- Saved $18.5 million AUD last year

In 1837, Australian Gas Light Energy (AGL) was founded in Sydney. At the time, Sydney was a small colonial outpost with less than 35,000 people, and "grid management" consisted of operating a few gas lamps. Today, AGL manages one-third of the energy generated for Australia's eastern seaboard, where most of the nation's population lives.

Acquisitions and renewable adoption have been accelerating growth. In 2012, when David Bartolo, AGL's head of asset performance, joined the company, it had grown from supplying 300 megawatts (MW) of electricity in 2005 to providing 5,500 MW of output and was looking to further expand to 9,000 MW.

However, growth came at a price. "We were completely data blind," said Bartolo. "I had built a central asset management team. They were really clever people with years and years of experience, and they couldn't see a single piece of real-time data centrally.

"I had to ask one of the sites to print off a trend every ten seconds and send me the screenshots so I could understand what happened during an overflow incident," Bartolo added. "It doesn't get worse than this."

Empowering employee innovation through data

AGL wanted everyone across the organization to have access to real-time data so they could be empowered to make changes that would benefit the bottom line. "What came along was a solution that really fit what we needed, and that was PI," said Bartolo. "It could connect to any one of our controllers. We could harvest every piece of real-time data and make it available to every person at AGL."

After a single day of training, AGL employees throughout the organization found new and innovative uses for the PI System. For example, one engineer built a display to see the aggregate view of how two solar farm sites were performing. Chemists set alarms to add years to the lives of boiler-cycle assets. And other users built screens to monitor generator temperatures.

A nonengineer built a screen to monitor trends in small hydro units located 700 kilometers away. Immediately, he could see why his machines were tripping and remotely directed on-site subcontractors to the source of the problem. In just three months, the availability of those hydro units rose by seven percent.

Avoiding outages with predictive modeling

In April 2015, AGL launched its Operational Diagnostics Center to move beyond real-time awareness to predictive modeling. The company implemented ECG's Predict-It anomaly-detection software for advanced pattern recognition. AGL employees built 2,700 models that monitor 45,000 critical data points every five minutes, correlating incoming data with historical data. When correlations begin to vary, the team knows that something is wrong.

The project's cost was substantial – $1.2 million AUD for initial setup and $620,000 for annual operating costs. However, the investment returned massive value quickly. In just three years, AGL saved $18.7 million AUD in reduced forced outages and optimized maintenance.

In addition, in 2017, the PI System enabled AGL to catch and prevent a catastrophic failure in a 560 MW hydrogen-cooled stator. Alarms from the PI System started ringing and the team saw anomalies in the hydrogen exit temperatures. An initial inspection did not reveal the cause. When the instrument was recalibrated and put back online, the data showed a worsening problem, so the team planned an outage to investigate. After a partial dismantle, the team found that they were mere days from a number of coils catching fire. Had that occurred, the resulting outage would have cost $50-$70 million AUD.
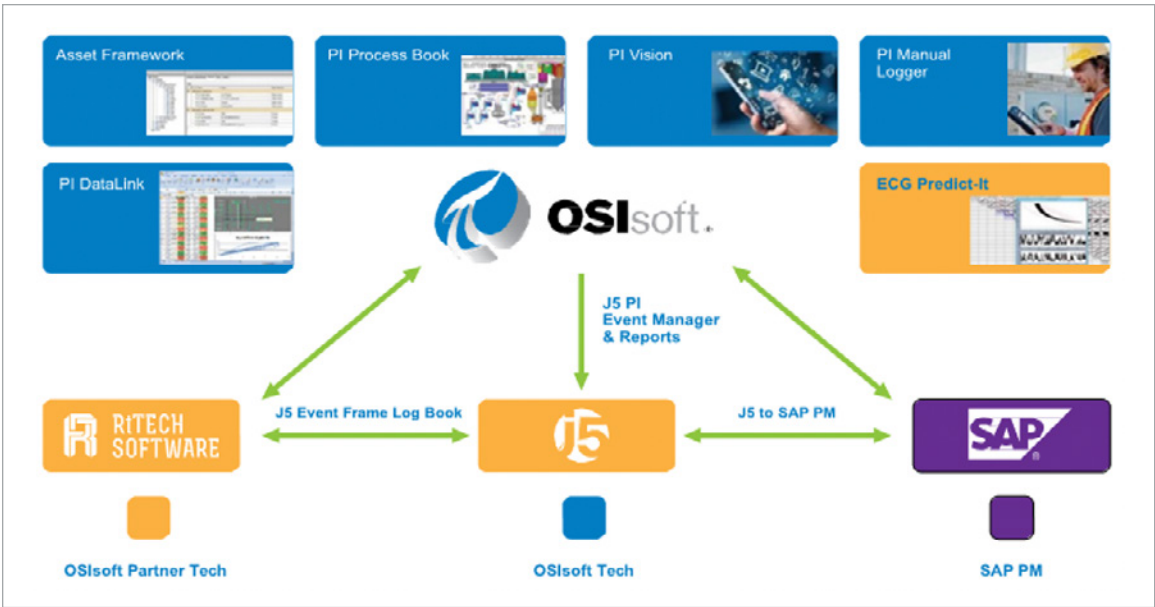
The PI System is the heart of AGL's operational technology platform.

Reducing fuel consumption and saving millions

Today, the PI System is the center of AGL's enterprise operational technology platform, and the energy company is deploying two new initiatives. The first, a thermodynamic performance-optimization system, aims to reduce fuel consumption by 0.5% and reduce CO_2 emissions, a marginal improvement that translates to savings of millions of dollars per year. The second, a wind-yield-optimization system, targets a one to two percent increased yield in AGL's wind portfolio.

For more information about AGL and the PI System, watch the full presentation here.