



# TransAlta Increases Availability to Its Highest Level in History

## Proficy SmartSignal Case Study

### RESULTS

- Within nine months of deployment, the solution paid back on the basis of maintenance savings alone.
- Within one year of deployment, TransAlta improved Sundance equivalent availability to its highest level in history.
- The solution avoided many major problems, including scoring of a boiler feed pump shaft and replacement of a 6000-horsepower motor.

TransAlta initially deployed the Proficy SmartSignal solution across the six-unit Sundance power plant, the largest plant in TransAlta's entire fleet.

Within one year of deployment, TransAlta improved Sundance equivalent availability to its highest level in history. Given this quick success and payback within nine months, TransAlta expanded the solution to additional plants.

### TransAlta's background

TransAlta is among Canada's largest nonregulated power-generation and wholesale-marketing companies. Based in Calgary, TransAlta operates 51 power plants in Canada, the United States, Mexico, and Australia — coal-fired, gas-fired, hydro, and renewable-generation assets. These plants have a total on-line capacity of 8219 MW.

### TransAlta's challenges

- Increase availability
- Reduce maintenance costs across its critical suite of assets
- Obtain greater value from the data that TransAlta was rapidly acquiring and accumulating through its data historian.

TransAlta organized a team of professionals whose job was to look for an advanced solution to help them analyze their data and provide predictive analytics. The team wanted a solution that



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would go well beyond the traditional and that would integrate well with their other tools. These engineers did a comparative analysis of the options, learned of the Proficy\* SmartSignal solution and its value and ease of implementation compared to all market alternatives, obtained management buy-in, and chose to proceed with deployment.

### Proficy SmartSignal installation

TransAlta decided to install the SmartSignal solution across the six-unit, 2020 MW coal-fired Sundance power plant, the largest plant in TransAlta's Alberta Thermal group and in TransAlta's entire fleet. Sundance was a plant in need of help, as much of it was more than 30 years old, and maintenance required close attention and cost reduction.

TransAlta was looking for an alternative to fixing Sundance's equipment when it fails — and incurring the resulting production losses.

**"It's like having your best operator on 24/7, looking at every piece of equipment in the fleet every five minutes."**

**Keith Christianson**  
Project Coordinator  
Generation Operations  
TransAlta

Installation included the SmartSignal solution's entire coal-fired suite: steam turbines, generators, condensers, boiler feed pumps, boiler fans, air heaters, pulverizers, and balance-of-plant pumps. The installation was smoothly and easily implemented and incorporated into the workflow, with one person taking full responsibility across all six units.

### Proficy SmartSignal benefits

Within six weeks of deployment, the SmartSignal solution identified the first of many major problems. The following happened:

- On May 12, the solution identified a 20 degree F rise within three hours in an inboard motor bearing temperature on a boiler feed pump. The resulting temperature was within the normal range for this particular pump, but the temperature was unusual when compared to all its associated sensors.
- The plant was immediately notified.
- The reliability engineering group began investigating the issue. After conducting a vibration analysis, the technicians reported that the bearing was beginning to fail. They went

about formulating a repair plan, which included gathering the necessary parts and instructing the operator to take the pump out of service immediately when the deterioration progressed enough to trigger a notification.

- On May 19, the temperature surged by nearly 70 degrees F, and the pump was shut down.

"Normal practice is to run the pump until an operator has an opportunity to investigate the problem. If we had done that, it would have scored the shaft minutes later, and we would have had to replace that 6000-horsepower motor to have the shaft rebuilt. Because the parts were on hand and shutting off the pump immediately limited the harm to minor surface damage, maintenance had it back on line in a record nine hours, which is about 25% less time than would otherwise have been required. Moreover, the repair was much less costly.

The solution's anticipation of the problem saved us a great deal of money. The system's power lies in its ability to boil down complex mathematical data into something that's easy to understand. Now our plant operators have a much clearer picture of what's going on, and they are aware of subtle changes in performance that could become serious problems."

Keith Christianson, TransAlta

### Expanding the solution

Within nine months of deployment, TransAlta claimed that the SmartSignal solution paid back on the basis of maintenance savings alone. This doesn't include the incremental savings from avoiding derates, increasing availability and reliability, and improving heat rates.

Within one year of deployment, TransAlta improved Sundance equivalent availability to its highest level in history.

The SmartSignal solution was next deployed at the other two plants in the Alberta Thermal group: the 766 MW Keephills and 279 MW Wabamun plants. And, because it proved to be highly valuable there, the solution later was deployed at the 1404 MW Centralia, Washington plant.

### Industry awards

In honor of its successful implementation of the SmartSignal solution, along with additional innovations, TransAlta's Sundance plant was awarded the 2005 Marmaduke Award by POWER magazine. In addition, TransAlta was awarded the 2005 Value Chain Award by M2M.

## GE Intelligent Platforms Contact Information

Proficy SmartSignal Solutions: +1 630 829 4000

[www.ge-ip.com/smartsignal](http://www.ge-ip.com/smartsignal)

