



CUSTOMER CASE STUDY

TransCanada: Fixing the million-dollar 'little things'

TransCanada - www.tcenergy.com
Industry - Transmission and distribution

Challenge

- Monitoring 31,000 miles of pipeline for disruptions to avoid incidents

Solution

- An enterprise analytics program that uses the PI System™ for analysis, flexibility, and scalability

Result

- \$10.5 million in failure-avoidance costs in the first three quarters of 2017

A cracked bearing. A broken valve plate. Wear and tear take their toll on even the largest and most sophisticated systems. For TransCanada – a large natural gas transmission company that serves more than 20 percent of the U.S. natural gas market – the failure of either of these faulty parts could have escalated into a catastrophic, multimillion-dollar incident. In both cases, thanks to the PI System, the company was able to spot the problem before it disrupted any of TransCanada's 31,000 miles of pipelines connected to U.S. high-demand markets.

Algorithms to detect anomalies

In 2011, TransCanada signed a full-scale Enterprise Agreement (EA) and adopted Asset Framework to structure its data. Soon afterward, it began a project using PI System analytics tools to detect mechanical anomalies before they escalate. Each year since the project was launched, the company has made dramatic improvements in the number of anomalies detected. Each one is a potential catastrophe avoided.

Today, the company is able to identify potential disruptions within the system in real time, due to more than 16,000 streams of data employing advanced algorithms. If engineers detect any variations in the system that exceed embedded levels of tolerance, they act.

For TransCanada, advanced data analysis is critical to monitoring a vast and complex system in the field. “It’s all about fixing little things before they become big things,” said Brendan Bell, TransCanada’s lead technical-reliability consultant.

A steady increase in savings

Since the launch of the PI System, the benefits of anomaly detection to TransCanada’s bottom line have been increasing year after year. In 2011, the year the project started, TransCanada saved \$94,500 in failure avoidance. It was enough for managers to see the merits of the PI System, and they expanded the project. In 2014, it detected 32 anomalies, saving the company an estimated \$1.93 million. In 2016, with 84 anomalies detected, total savings fell just short of \$8 million. And in 2017, 129 anomalies detected saved the group \$10.65 million by the third quarter.

All of this has been achieved against a backdrop of rapid growth in TransCanada and across a fleet of equipment in 36 states that runs a wide gamut of age, sophistication, and digital connectivity.

“We have an extremely large fleet, and a very diverse fleet as well,” Bell said. “We’ve got small reciprocating units, 300 horsepower, to very large turbines of 35,000 horsepower. We’ve got equipment that was installed in the 1950s, equipment that was being installed in the most modern turbines in the world. We want to monitor everything.”

The benefits of enterprise analytics to TransCanada go beyond fixing problems. When an issue is resolved, it is tracked and stored in a digital library for future reference so company engineers and crews can easily consult the record if similar problems arise in the future.

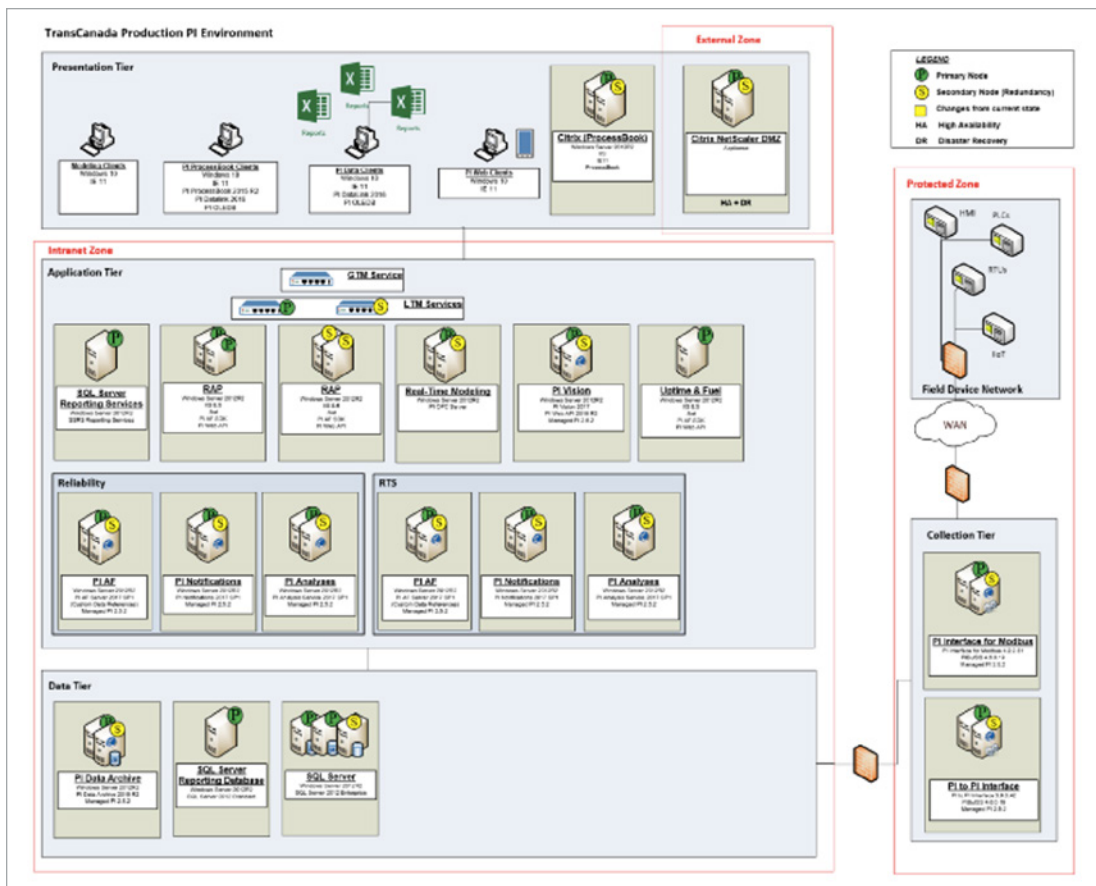
In the oil and gas industry, data increasingly drives business. Like many companies in the industry, TransCanada has embraced investment in high-quality data and enterprise analytics, and those investments have yielded real returns for the bottom line.

“It’s all about fixing little things before they become big things.”

-

Brendan Bell,

Lead Technical-Reliability Consultant, TransCanada



The PI System is fundamental to TransCanada's logical architecture.

Next steps: A fleetwide dashboard and growth modeling

Though TransCanada has experienced dramatic results with the PI System, the company has kept the project streamlined and manageable. The team responsible for various operations-data projects has 16 members spread across three divisions: enterprise analytics, optimization, and performance.

The anomaly-detection program has proved its worth to the business over the past several years, and TransCanada is now working on ways to get more value and function out of the PI System. The company has rolled out a new fleetwide dashboard so engineers and managers can view and compare equipment in real time across the enterprise. The company is also working with analytics tools to do growth modeling, which is helping TransCanada prioritize capital spending on its fleet.

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