

Reducing Alarm Fatigue in Upstream to Improve Pipeline Leak Detection

RESULTS

- Reduced detection time for pipeline leaks and other anomalies
- Met government regulations for backup leak detection system
- Accurately alarmed and reduced 'alarm fatigue' among field staff



APPLICATIONS

- Zedi Pipeline Leak Detection
- Zedi Access
- Zedi Go Mobile App
- Zedi Alarm Management Services

CUSTOMER

International oil and gas producer in Calgary, Alberta

CHALLENGE

The staff of a large oil and gas producer was inundated with approximately 40 alarms per month. Because very few of these alarms indicated an actual pipeline leak, field personnel began ignoring alarms which could mean a real leak might be ignored, causing significant damage to lease property before the leak can be caught, repaired, and remediated.

To overcome alarm fatigue, the company tried taking readings less often. However, this approach increased the risk of delay in finding a leak. They also considered factoring in a 10% margin of error when comparing input/output volumes but was concerned that even with fewer readings, false alarms would still exist and field personnel would develop a new threshold for alarm fatigue.

“Removing the wasted time of false alarms for pipeline leaks and giving that time back to our operations has made an impressive impact on how our people are able to make better use of their time and has created much more focus for us all.”

Oil and gas producer in Calgary, Alberta
CEO

CHALLENGE *(cont'd.)*

In addition, the operator was also concerned about meter errors and the time it took employees to analyze the data effectively. They needed to reduce false alarms and increase data accuracy, ensuring employees can utilize their time much more efficiently.

SOLUTION

Emerson's Zedi Cloud SCADA Data Scientists worked with the operator to develop a statistical approach that could characterize the asset's normal operation and distinguish abnormal patterns in the data.

The customer worked with Zedi before, and we were developing Artificial Intelligence (AI) Systems that could be trained to separate alarm-worthy incidents from non-emergency anomalies.

Using data from a monitored test section of pipe, an approach was introduced to avoid triggering alarms when operational transitions occurred. Such transitions can create fluctuations in flows and pressures that can generally be interpreted as anomalies.

Our solutions processed and analyzed sensor information as soon as it arrived to our Zedi Cloud-based platform. The data was cleaned up, verified for consistency, and filtered prior to analysis. We used the Sequential Probability Ratio Test (SPRT) to validate or disprove our null hypothesis of an anomaly being present.

During the test, the system accurately identified normal pipeline flow transitions without creating alarms. Other anomalies identified were buildup in the flow meters, compressor issues, problems with the water level in the inlet separator, meter errors, and plant shutdowns.

Once the testing phase was complete, the customer implemented the solution to their existing pipeline monitoring system and used Zedi Alarm Management Services to monitor, control and ensure effective alarm management for their pipelines that are located upstream.

The customer can now unlock more value from their operational data. Personnel can also access data from anywhere to utilize their time effectively and make more informed decisions with a stronger focus on managing operations.

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