AVEVA™ Pipeline Integrity Monitor

Tools to prevent, detect, and mitigate pipeline commodity releases

AVEVA Pipeline Integrity Monitor offers pipeline companies a holistic view toward preventing, detecting, and mitigating the impact of commodity releases.

Oil and gas pipelines are considered critical assets of economic development for any country and the pipeline companies operating the pipelines are generally required to ensure the safety of the population and environment where these pipelines run either due to regulatory compliance or internal company policies.

Additionally, unauthorized and dangerous extractions (theft) in the middle of the pipeline are not uncommon in some parts of the world. In these cases, leak detection is not strictly about protecting the environment and pipeline property but also protecting the safety of the thieves themselves.

AVEVA

Focus on pipeline integrity

As a result of the above complexities, pipeline companies are putting a greater emphasis on utilizing pipeline integrity management. The purpose of pipeline integrity management is to ensure that pipelines do not cause harm to people or the environment, while at the same time providing reliable and secure service to pipeline operators and customers. Pipeline Integrity can coarsely be divided into preventing the leak from occurring, detecting the leak if it occurs, and mitigating the impact of the leak after it has occurred. AVEVA Pipeline Integrity Monitor is perfectly positioned to assist pipeline operators in this respect.

Prevent problems upfront

AVEVA Pipeline Integrity Monitor assists the pipeline operator with preventive features like over/under pressure detection analysis.

Mitigate the impact

AVEVA Pipeline Integrity Monitor assists the pipeline operator with impact assessment analysis tools like giving an estimate as to the amount of volume lost and performing a location analysis.

Detect it

AVEVA Pipeline Integrity Monitor offers a number of methodologies for detecting a leak, such as:

- Computational Pipeline Monitoring (CPM) based on the Real-Time Transient Model methodology, as outlined in API RP 1130.
- CPM based on the Volume Balance methodology, as outlined in API RP 1130.
- CPM based on the Compensated Volume Balance methodology, as outlined in API RP 1130.
- Rate of Change (ROC) and Rate of Change Combination (ROCC) monitoring for rupture detection.
- Pressure loss leak detection for pinhole (theft) or rupture detection, as dependent on implementation.
- Shut-in detection accounts for pressure and temperature changes in a closed-off section.
- AVEVA Pipeline Integrity Monitor also has the following functionalities available:
  - Dynamic thresholds allow thresholds to be automatically raised and lowered due to activities being performed physically on the pipeline.
  - Leak location capability is available either based on the nearest milepost or to a pre-identified operating section.
  - Intelligent voting mechanism (alarm layer) for analyzing output from various leak detection methodologies to consolidate to one leak/no leak alarm.

Negative pressure wave

Drastically improve the sensitivity and accuracy of leak detection within your pipeline systems with the use of the negative pressure wave (NPW) leak detection method in AVEVA Pipeline Integrity Monitor. Take advantage of the two types of NPW leak detection methods that can be utilized in your pipeline systems: decompression wave leak detection and wave front leak detection.

Decompression wave leak detection:

- An enhancement to the primary leak detection methods (RTTM or CVB), decompression wave leak detection improves the precision in leak detection within pipelines.

- Analyze SCADA pressure transmitter data collected along the pipeline to detect unexpected decompression waves, which may signal a leak event.

- Configurable thresholds and averaging periods can trigger event alerts, facilitating precise localization of potential leaks based on pressure deviations.

Wave front leak detection:

- This edge-based leak detection method uses a high-resolution pressure transmitter to detect the leading edge of a decompression event.

- Using machine learning (ML), the wave front algorithm normalizes, stores, and classifies decompression signals.

- If a match is found, the solution calculates a location and raises an alarm.

Benefits:

1. **Enhanced sensitivity:** NPW enhances the sensitivity of leak detection and finds potential leaks more effectively.

2. **Improved location accuracy:** By analyzing multiple decompression wave detections, the location of potential leak events are more accurately determined, facilitating rapid response and mitigation efforts.

3. **Reduced false alarms:** Configurable threshold settings help minimize false alarms, ensuring that resources are efficiently allocated for genuine leak events, thereby reducing operational disruptions and costs.

4. **Operational flexibility:** NPW offers flexibility through dynamic threshold events, enabling adjustments based on transient events and operational requirements. This ensures optimal performance under varying conditions.

5. **Increased reliability:** NPW integrates advanced technology, such as machine learning (ML) and pattern recognition, enabling the system to adapt and improve over time and enhancing overall effectiveness and reliability in leak detection.

An integrated approach

AVEVA Pipeline Integrity Monitor is based on a common advanced application development environment for building advanced simulation software applications for the pipeline industry. AVEVA Pipeline Integrity Monitor has common configuration tools, a common database, common pipeline model connectivity, and common runtime environment with other offerings from AVEVA, creating a unique, integrated solution.

The experts in leak detection

AVEVA has been designing leak detection systems for pipelines for over 20 years and is recognized by industry experts as a leader in the field. No single leak detection methodology fits every pipeline. As there is no one-size-fits-all approach, each pipeline should be evaluated independently and recommendations made accordingly. AVEVA Pipeline Integrity Monitor provides fit-for-purpose leak detection while allowing the customer to take a holistic view of the why, where, and when associated with pipeline commodity releases.

For more information, please visit:
aveva.com/en/products/aveva-pipeline-integrity-monitor