Industry Brochure

Mining and slurry pipelines

ATMOS INTERNATIONAL

Efficient leak detection that manages the changing densities of slurry and tailings

Long distance slurry pipelines are widely used in the mining industry and, compared to bulk transport systems, have a good performance record for high-availability, excellent safety, and profitability in transporting mineral concentrates such as coal, copper, iron, phosphates, and oil sands. Mining operations also use shorter pipelines to pump tailings or water. The abrasive products transported can erode the pipeline wall, causing a leak or even a rupture. Pipelines in areas prone to mudslides or earthquakes are at even greater risk of a spill.

The non-Newtonian nature of slurry makes model-based leak detection less effective than Atmos systems

Unlike the model-based leak detection systems historically used on slurry pipelines, the Atmos leak detection technologies dedicated to mining applications do not attempt to model the composition and viscosity of the slurry transported in the pipeline. These Atmos systems thus avoid the high false alarm rate and poor accuracy displayed by real-time transient models because real-time transient models cannot accurately model the continually changing composition and viscosity of mineral compounds in a slurry pipeline.

Very reliable leak detection systems that minimize pipeline shutdowns

Leak detection in slurry pipelines must be reliable because stopping the flow for a false leak alarm could block a pipeline as the particles fall out of suspension, causing expensive downtime. The mining industry has embraced the Atmos leak detection solutions after rigorous operation and head-to-head testing against the older technologies proved the superior reliability of Atmos on slurry pipelines over the past 15 years.

Atmos Pipe – detected more pipeline leaks and ruptures around the world than any other system

Pipeline controllers trust the excellent reliability of the Atmos Pipe statistical volume balance leak detection system. Prompt response to leak alarms by operators has minimized the significant costs of dozens of real pipeline leaks and ruptures.

The solution uses the corrected flow balance in conjunction with sophisticated statistical techniques such as the powerful Sequential Probability Ratio Test (SPRT) to always optimize leak detection and leak location without the need to know the product composition, making it ideal for slurry and tailings pipelines.

After every data sample, Atmos uses the corrected flow difference to calculate the probability of a leak being present. If the mean of the corrected flow difference increases statistically compared to what is normal, then the probability of a leak will increase.

If this increase in corrected flow difference persists for longer than the leak detection time, Atmos Pipe generates a very reliable leak alarm.

The nature of slurry products makes accurate and repeatable flow measurement more challenging than other products. Atmos Pipe uses patented algorithms and self-trained filters to automatically compensate for those measurement errors to maximize sensitivity and reliability of leak detection performance.

Atmos Wave: ultra-fast and accurate leak detection for pipelines without flow meters

An economical solution for pipelines that lack flow meters, Atmos Wave has been successfully deployed on slurry pipelines and water pipelines in mining operations. Atmos Wave detects the rarefaction wave caused by a leak in a pipeline. When a leak occurs, the rarefaction wave travels away from the leak in both directions along a pipeline. Atmos Wave uses fast-response, high-resolution, pressure sensors to detect and filter the pressure signals, searching for signals with the frequency and magnitude of a leak. The system accurately calculates the leak location based on the time the pressure signal takes to reach the pressure sensors.

Over 15 years providing industry-specific solutions to the mining sector

Atmos has the experience to understand the unique risks of operating slurry pipelines and the challenges in detecting leaks in the mining industry. Real leak and rupture data from slurry pipelines was used to tailor the statistical volume balance system for slurry and tailings pipelines. This statistical leak detection system has proven to be more reliable than model-based leak detection systems on slurry pipelines over the past 15 years, significantly reducing the number of pipeline shut-downs, saving the pipeline operators thousands of dollars.

Atmos International (Atmos) provides pipeline leak detection and simulation technology to the oil, gas, water, and associated industries. The company was founded in 1995 in the UK by the inventor of the statistical pipeline leak detection system – Atmos Pipe, now one of a suite of leak and theft detection solutions from Atmos. These technologies are implemented on hundreds of pipelines in over 50 countries, including major oil and gas companies such as Shell, BP, ExxonMobil, and Total.

With associated offices in the USA, China, Russia, Singapore and Costa Rica, and local agents in 28 countries, the multi-cultural and multilingual team can provide effective support all over the world.

E commercial@atmosi.com
W atmosi.com

ATMOS INTERNATIONAL

ATMOS_IBEN_MINSL_04/19