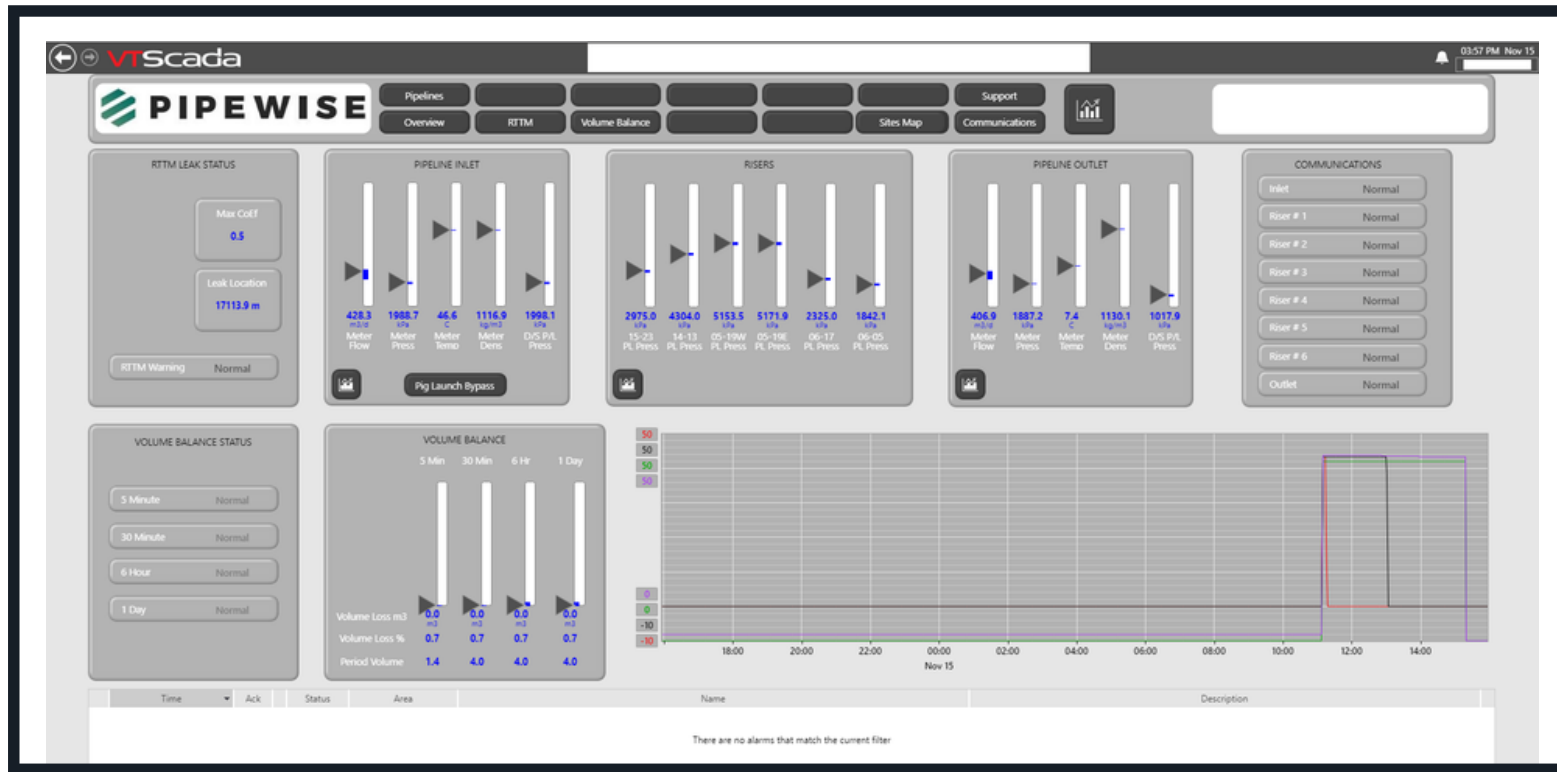




Leak detection systems (LDS).

How Pipewise can help better protect & safeguard your pipelines, personnel & the environment.





Introducing the Pipewise Leak Detection System.

For single-phase liquid pipelines. From new or existing to simple or complex.



Super intelligent CPM leak detection.



Fit for purpose & cost effective.

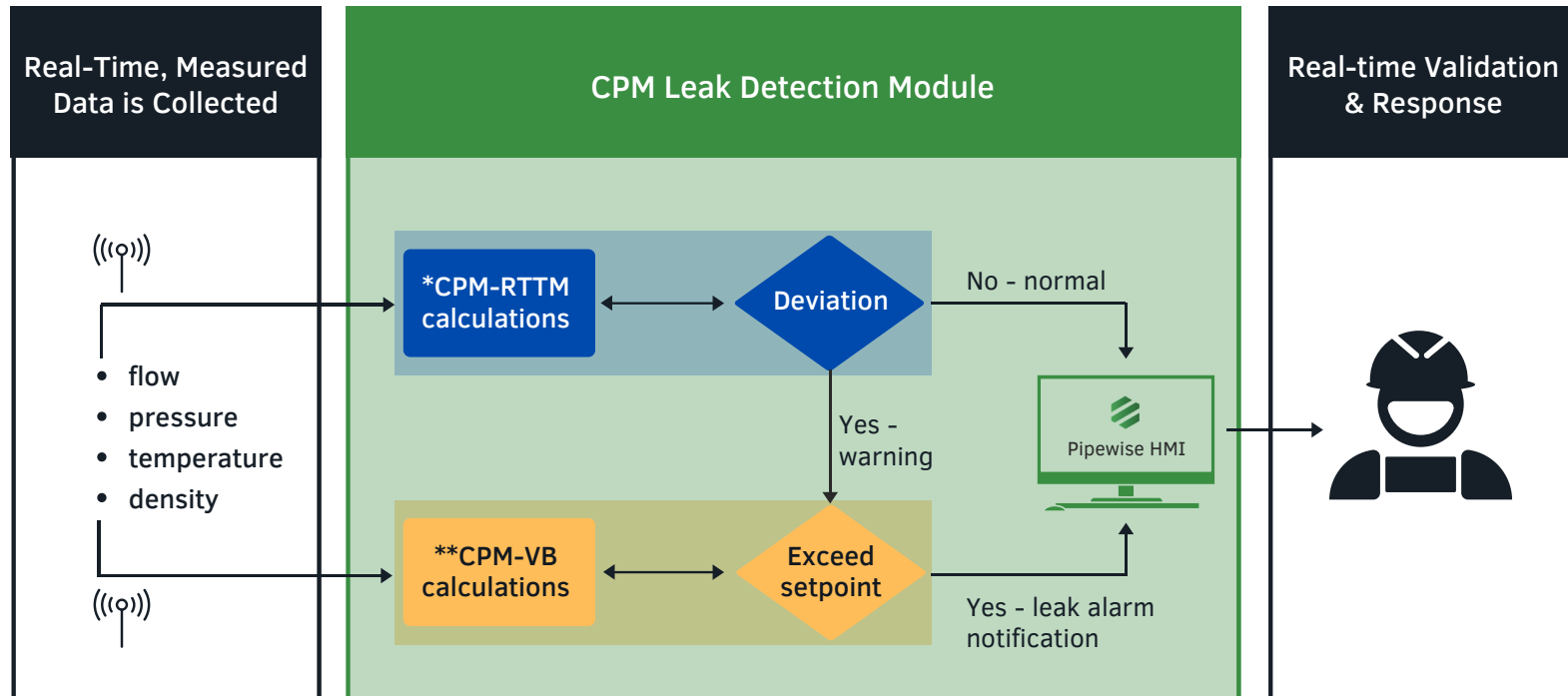


Conforms & adapts to evolving needs.



Installed, supported & maintained by an experienced team.

Here is how the system's computational pipeline monitoring (CPM) leak detection software works.




*CPM-RTTM = Computational Pipeline Monitoring (CPM) - Real-Time Transient Modeling (RTTM).

**CPM-VB = Computational Pipeline Monitoring (CPM) - Volume Balance (VB).


Pipewise CPM features that greatly enhance leak sensitivity & reliability compared to other systems.

01 Sliding time scale




5, 10, 30min, 6 & 24hr sliding time windows. Improves detection time & reliability.

02 Inventory calculations



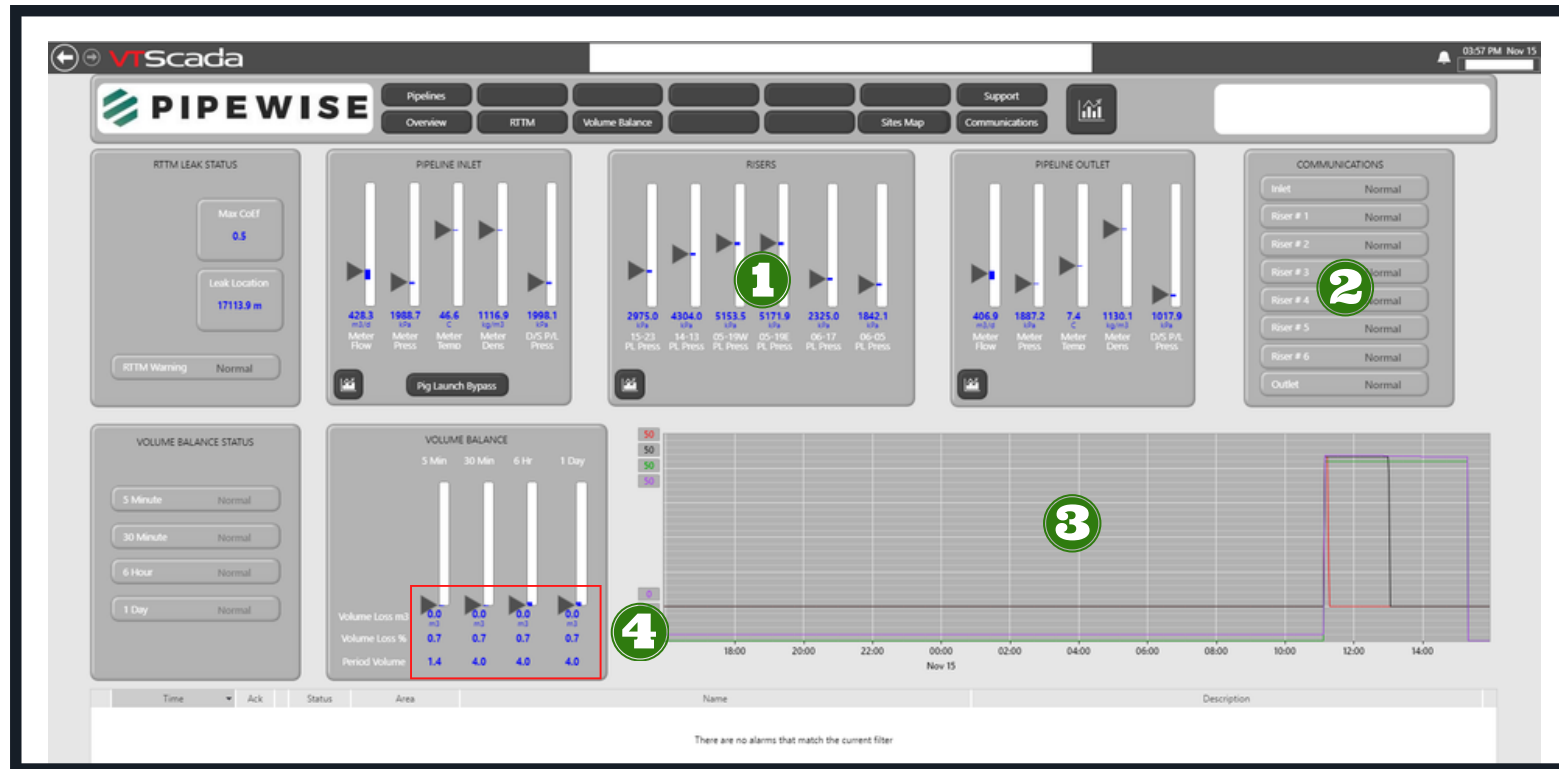
Continuous calculations enhance sensitivity while mitigating false alarms.

03 Signature recognition



Produces smarter data & leak detection for a more protected, efficient pipeline.

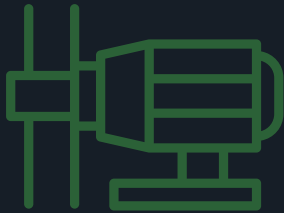
The HMI displays pertinent pipeline data, in real time, for efficient Operator monitoring & validation.



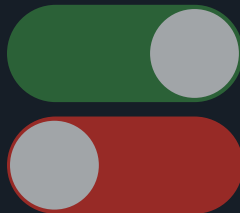
Notes:

- ① Pipeline operating data (inlet, riser(s), outlet).
- ② Pipeline communications.
- ③ Pipeline operational trending.
- ④ Diagnostic data and alarm notification.

It's Predictive Analytics (PA) enable data driven, on the fly decisions for an optimized pipeline & OPEX.



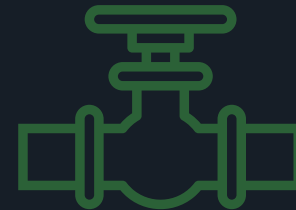
Pigging procedure/
scheduling.



Controlled start-
ups/shut-downs.

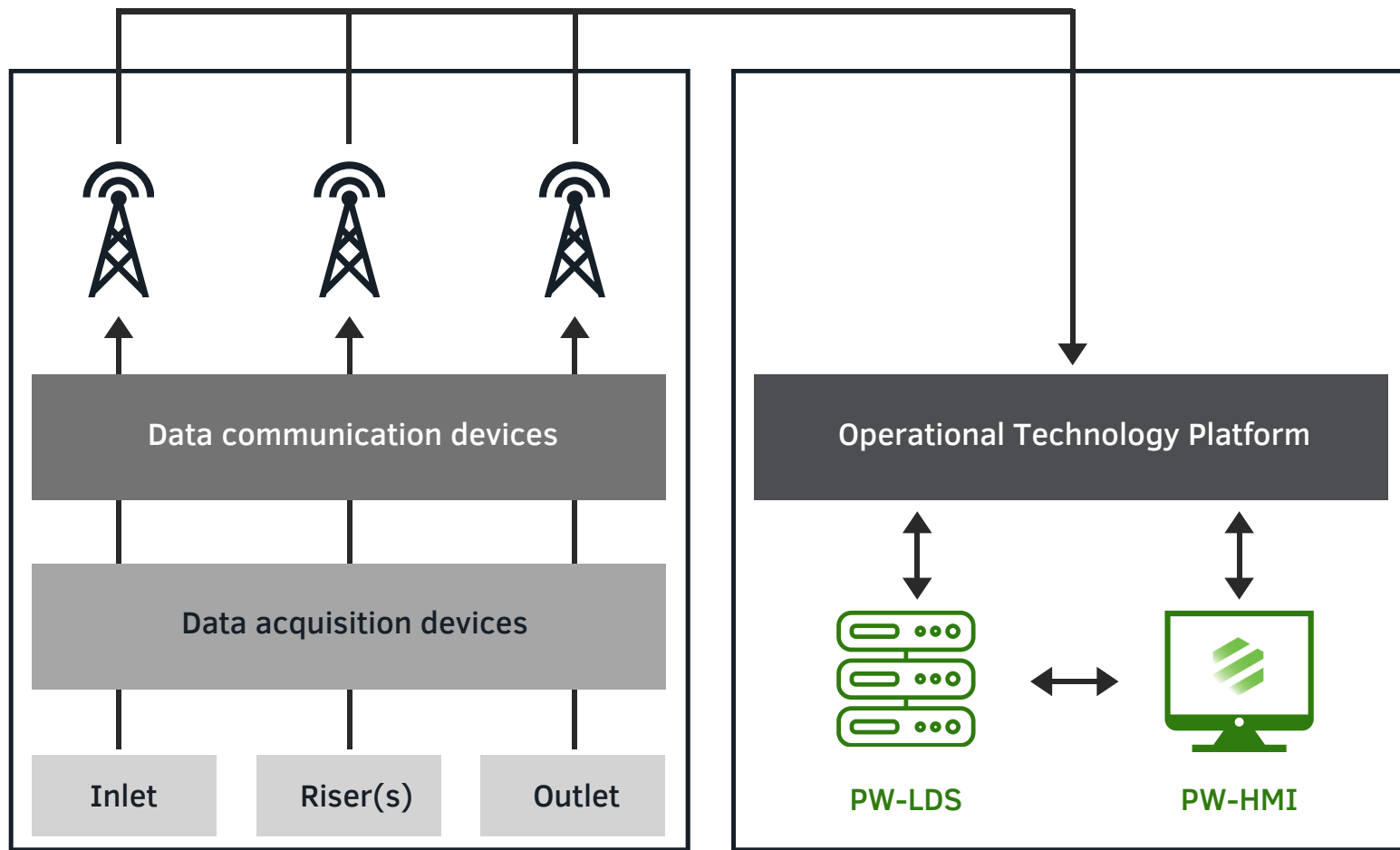


Overpressure monitoring
& prevention.



ESDV & BPCV
operations.

The LDS can be configured to your data comms. & instr. & implemented into your platform (if appl.).



Your dedicated Account Management team with 70+ years of field experience. 24/7 support.



PW Team Member

The Benefits



Account Management

- Your single point of contact. Dedicated to your needs.
- Reviews monthly/quarterly system performance reports with you.
- Spearheads system optimization & continuous improvement.



Leak Detection Specialists

- Lean on our LD Specialists to develop & manage a leak detection program on your behalf, or ask for a 2nd opinion and/or audit.



Field Service EI&C Techs.

- With boots on the ground, EI&C techs. are always close by to support operations, troubleshoot or manage any ad-hoc issues.



Systems Team




- Available 24/7, our Systems Team ensures system uptime, quality data, maintenance & support.



Suggested next steps on how we can get started.




01

Receive LDS budgetary pricing for a certain pipeline or network.

-  Provide your pipeline profile & data via an RFI.
-  We'll perform a quick assessment.
-  And provide an LDS recommendation & budgetary pricing via a demo presentation.

02

Trial our LDS to get a good feel of the system & it's performance.

-  We'll collect historical or live pipeline data from your team for HMI display.
-  Live data will be reported via the HMI for your team to monitor, trend & leverage.
-  At the end of the trial, we'll present a Pipewise performance report vs. your current system to see how it compares.



Appendices

- 01 Latest case studies
- 02 Project implementations to date





Case study #1

How WaterBridge implemented a reliable CPM leak detection system that's tailored to each application & supported by a 24/7 team. All at a set price.

01

The profile

A complex, 20+ node produced water network, with on-the-fly flowrate adjustments and pump starts/stops.

02

The challenge

WaterBridge requires a reliable, flexible and scalable leak detection program. Solutions they trialed were either out of the box, inflexible & pricey, or ineffective and lacked support.

03

The solution

We developed a CPM-LDS that can be tailored to each network, integrates with their Ignition historian & MQTT broker & handles low communication areas & dynamic operating conditions.

04

Testimonial

“WaterBridge is currently using Pipewise for leak detection within our Eagle-Ford assets and the scalability of the platform allows us to apply leak detection to our broader operations. Pipewise has been engaged in helping us solve challenges around utilizing leak detection effectively in low communications areas and have been open and accepting to try unique and custom solutions to meet our needs. The partnership with Pipewise allowed our company the flexibility to pursue leak detection using MQTT, and the ability to integrate the software within our own Ignition platform. The ability to integrate into Ignition, the ease of use, and use MQTT has made Pipewise a strong choice to meet our leak detection needs.”

WaterBridge Control Center (WCC)



Case study #2

Secure was experiencing a high false alarm rate @ 7%. Pipewise reduced it to 0.3%.

01

Client & profile

Secure Energy (midstream co.) - 15 mile, 6" produced sour water line.

02

Trialed

Secure trialed the VB-LDS (volume balance leak detection system).

03

Objective

To compare their current leak detection & false alarm rate performance vs. the CPM-LDS.

04 Result

Reliability - record	Reliability - result	Sensitivity-improvement	Client - feedback
Secure False alarms /transient events 23/322	Secure False alarm rate 7.14%	10 min. (live window)	"To date, we've purchased two systems and Senior Mgmt. are very impressed with the results."
Pipewise False alarms /transient events 01/322	Pipewise False alarm rate 0.31%	Pipewise Tuned the LDS	
		4.5 bbl (threshold)	



Case study #3

CNRL was wanting a more sensitive & reliable LDS with local support.

01

Client & profile

CNRL (large Canadian E&P) - 56 mile, 4" condensate line with three (3) river crossings.

02

Installed

CNRL installed the Pipewise VB/RTTM LDS (volume balance/RTTM leak detection system).

03

Objective







To install a more cost effective & sensitive CPM LDS, supported by a local team.

04 Result

Sensitivity		Accuracy		Reliability		Client - feedback	
% of pipeline flow rate.	0.5%	Leak localization	+/- 2 mi	False alarm rate	0-1%	"The system is adaptable, robust, and accurate in find and localizing leaks". "Thanks for the help with troubleshooting. Top notch customer service as always".	
Detection time (mins.)	2-4	Detected leak vol. vs. measured.	+/- 10%				

Current projects with various clients in various applications.



Select Clients	Current Projects	Total Distance Detected	Project Objectives
 WATERBRIDGE	01 (prod. H2O)	45 mi.	Replacing current LDS on a 21 node network.
 Canadian Natural	03 (condi, sour crude)	86 mi.	All replacing current SCADA LB LDS's.
 KINETIK	08 (NGL)	223 mi.	Deploying onto existing pipelines.
 ARC RESOURCES LTD.	07 (oil well eff., prod. H2O, LVP)	212 mi.	Deploying onto an existing pipeline.
 WHITECAP RESOURCES INC	04 (produced water)	53 mi.	Deploying onto a new pipeline.
 SECURE ENERGY	04 (produced water)	147 mi.	Replacing current SCADA LB LDS.
Total	27	766 mi.	



**Thank you for
considering
Pipewise.**

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