



IntelliView

INTELLIGENT VISION SOLUTIONS

Pipeline Facilities Leak Detection

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intelliviewtech.com

IntelliView - What we do

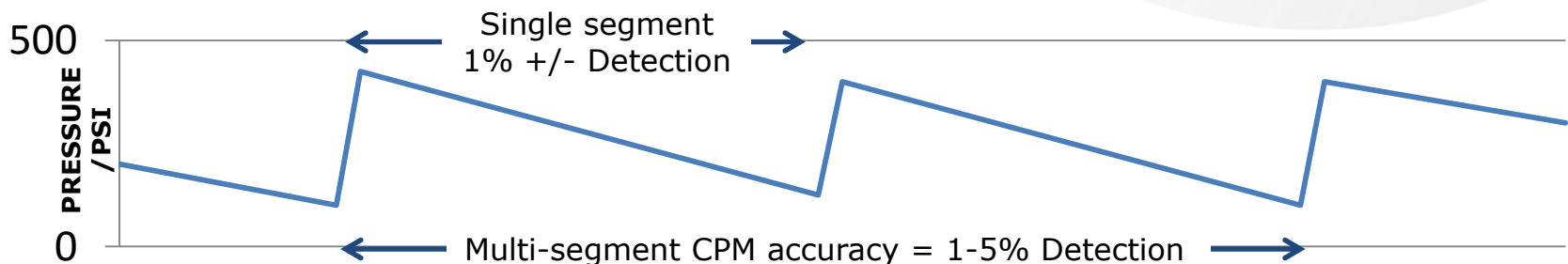
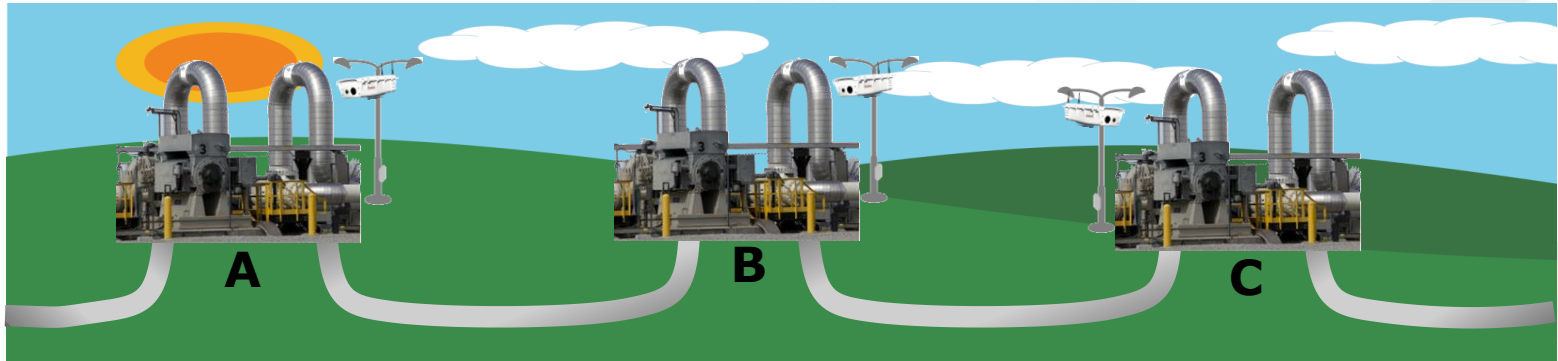
- Twelve years in video analytic research
- Research oriented until 2012, then focused on Pipeline leak detection targeted specifically to address the needs of the Oil and Gas Industry
- Use of LWIR thermal cameras combined with HD colour to detect and report leaks at above ground pipeline facilities
- Why Pipelines?
 - Most pipeline leaks occur at facilities (Pump stations, meter points, pig stations etc.)*.
 - Facilities not covered adequately by traditional Computational Pipeline Monitoring
 - Due to transients introduced at pump stations from valves and pumps, detection limits typically run in excess of 1-5%
 - For a typical pipeline with a capacity 500k barrels/day a 1% error translates to 146 gpm
 - This coverage gap highlights the need for alternate leak detection methods required for above ground pipeline stations
 - IntelliView Leak Detection systems detect leaks as small as 2 gpm

* Source – API PPTS ADVISORY 2009-5

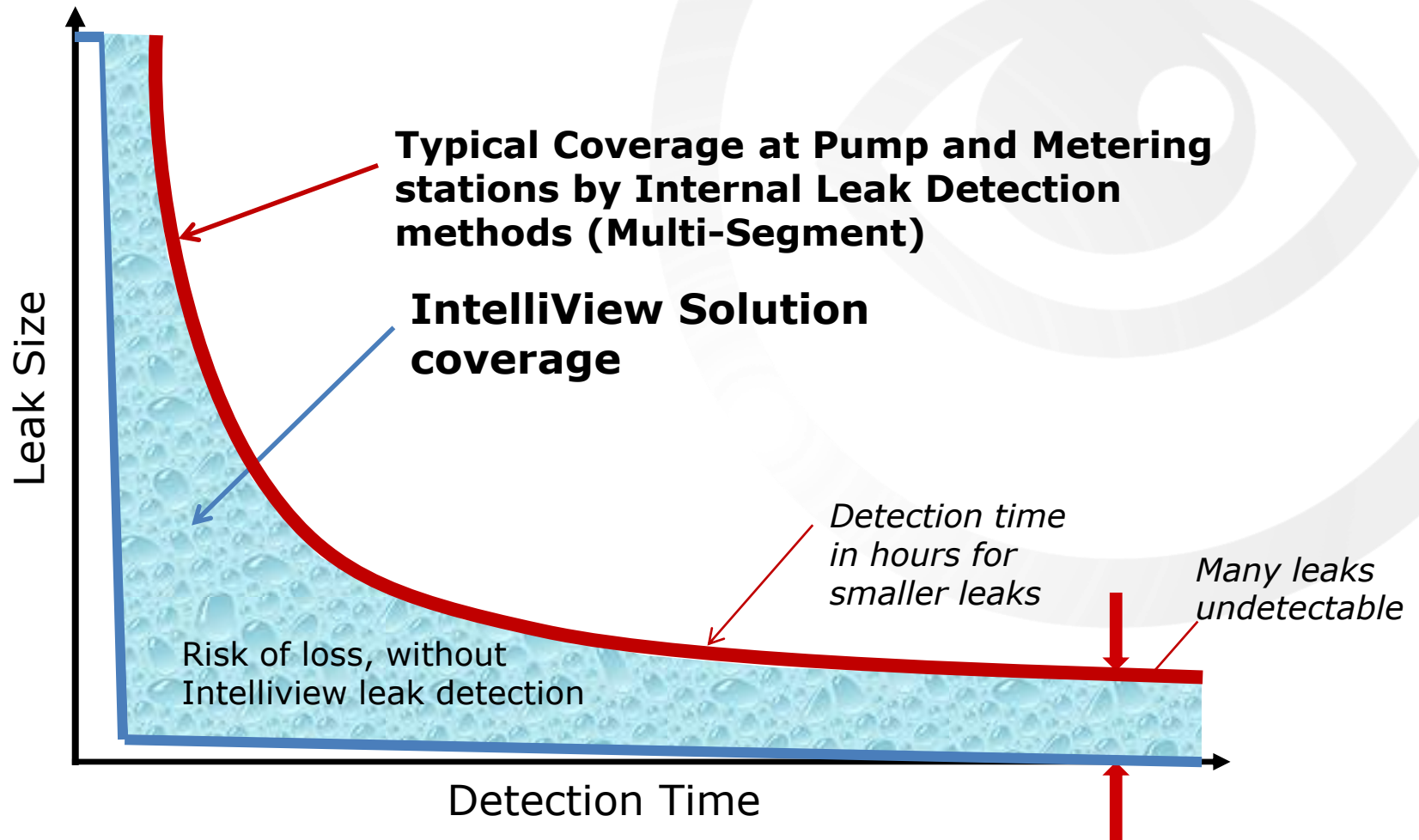
(http://www.api.org/~media/files/oil-and-natural-gas/ppts/advisories/2009_5ppts_operator_advisory_facilities_otc_final.pdf?la=en)

Pipeline Topology

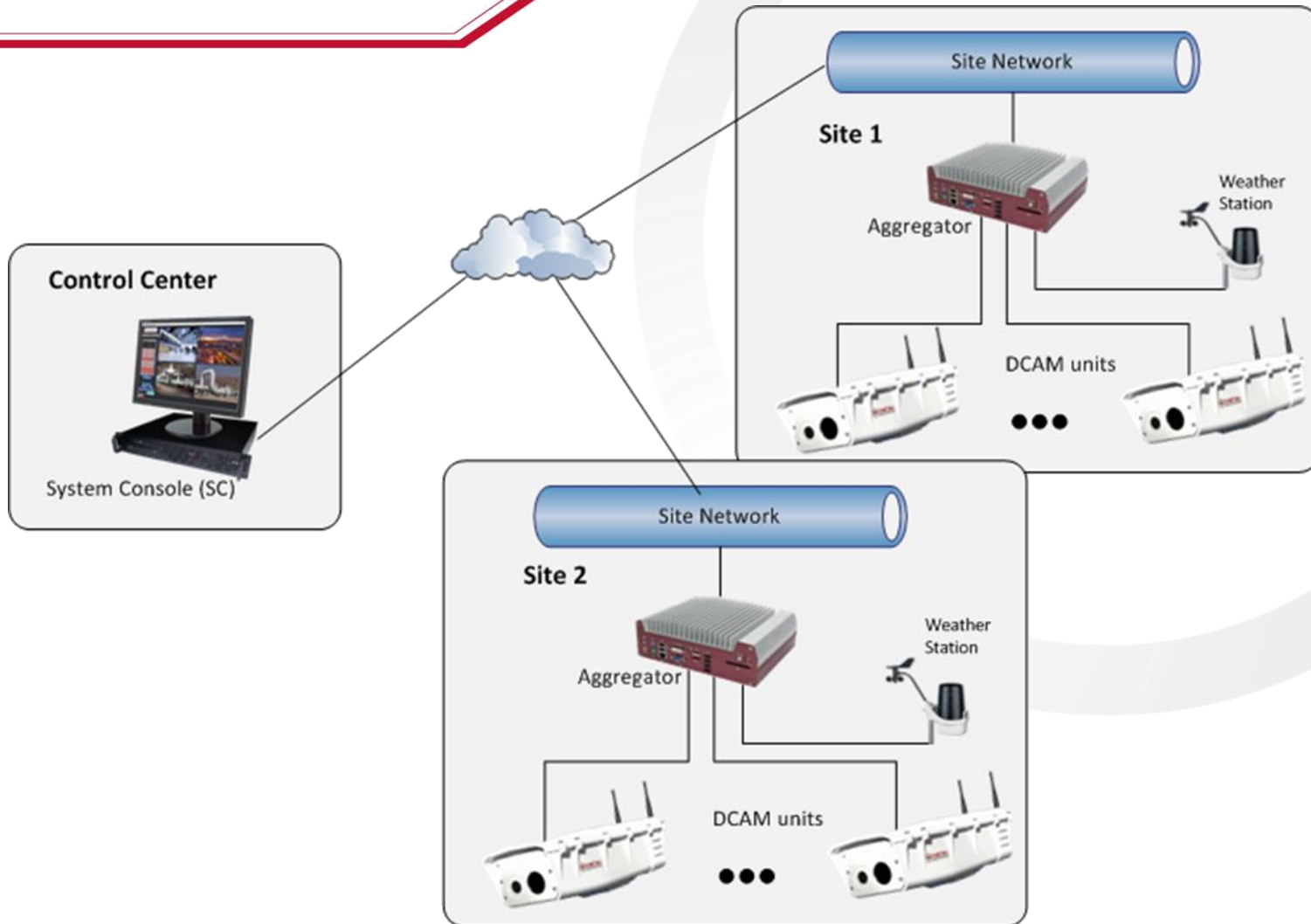
- Pipelines consist of underground pipe with above ground facilities spaced 50-80 km apart and predominantly unmanned
- CPM (Computational Pipeline Monitoring) uses sensors (pressure, flow, temperature etc.) located at above ground stations to calculate flow and pressure imbalances to detect leaks
- CPM accuracy can achieve 1% accuracy for single segment calculations but worsens as length and complexity of the measured segment increases (ie: accuracy in segment AB will be higher than AC)



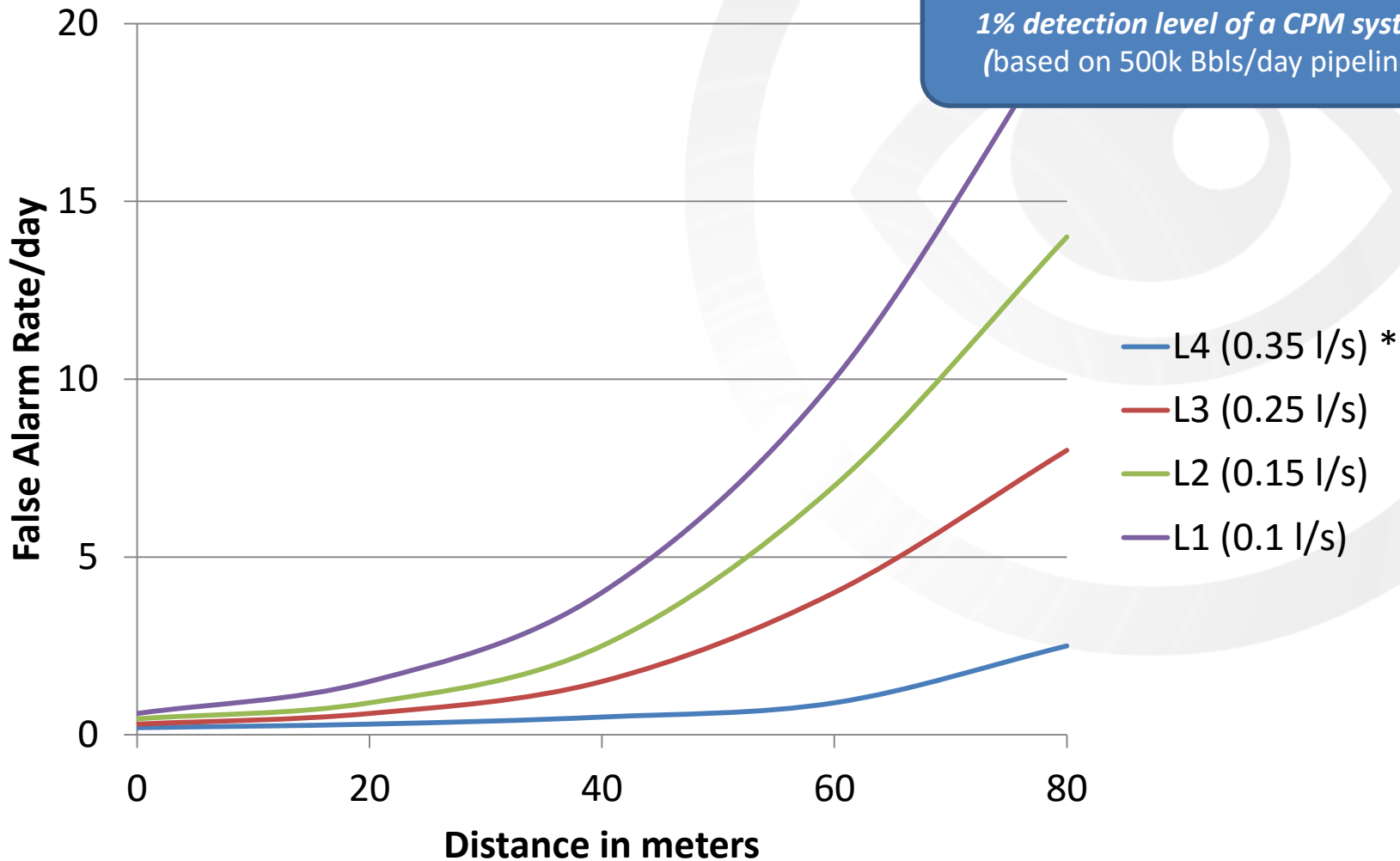
Defining the need for Facilities Leak Detection



System Topology



Relationship of Leak Size, Distance and False Alarm Rate



What we learned - Process

- Need to calculate and continually refine the business proposition
- Introducing new technology requires appropriate lead customers
- Customers need claims and results that are measurable, tested and repeatable
- Extensive field testing is an absolute requirement
- In house simulation is an absolute requirement
- Automated testing is worth the trouble (even in development)
- Need to balance research and development/production even in crunch times

What we learned - Field

- Detection is easy, detection while minimizing false alarms is tough
- Initial development – how to detect leaks
- Continued Development – how to detect leaks while rejecting...
 - Wind
 - Rain
 - Rain in Texas
 - Snow, falling, melting
 - Solar loading
 - Solar Loading with wind and clouds
 - Heating pipes
 - Workmen
 - Critters
 - Etc.

[Leak Detection](#)

[Leak Detection gone bad](#)

A decorative red line starts from the left edge, moves horizontally, then diagonally up and right, then horizontally right, and finally diagonally down and right. In the background, there is a large, faint, light gray graphic of an eye with a circular border around it.

Questions?