



POWERFUL ANALYTICS.
ACTIONABLE INSIGHTS.

Introducing iHydrant®

Powerful Analytics. Actionable Insights.

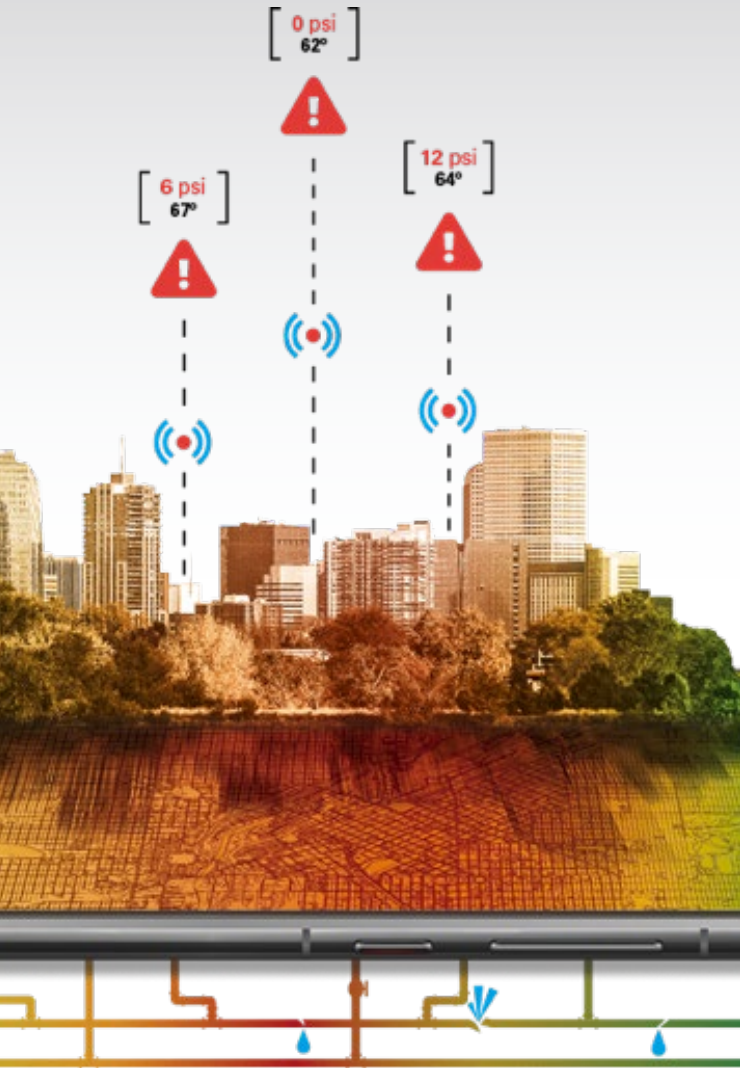


M&H VALVE COMPANY



KENNEDY VALVE





Why Pressure and Temperature Monitoring is Important

➤ ASCE's 2021 Infrastructure Report Card

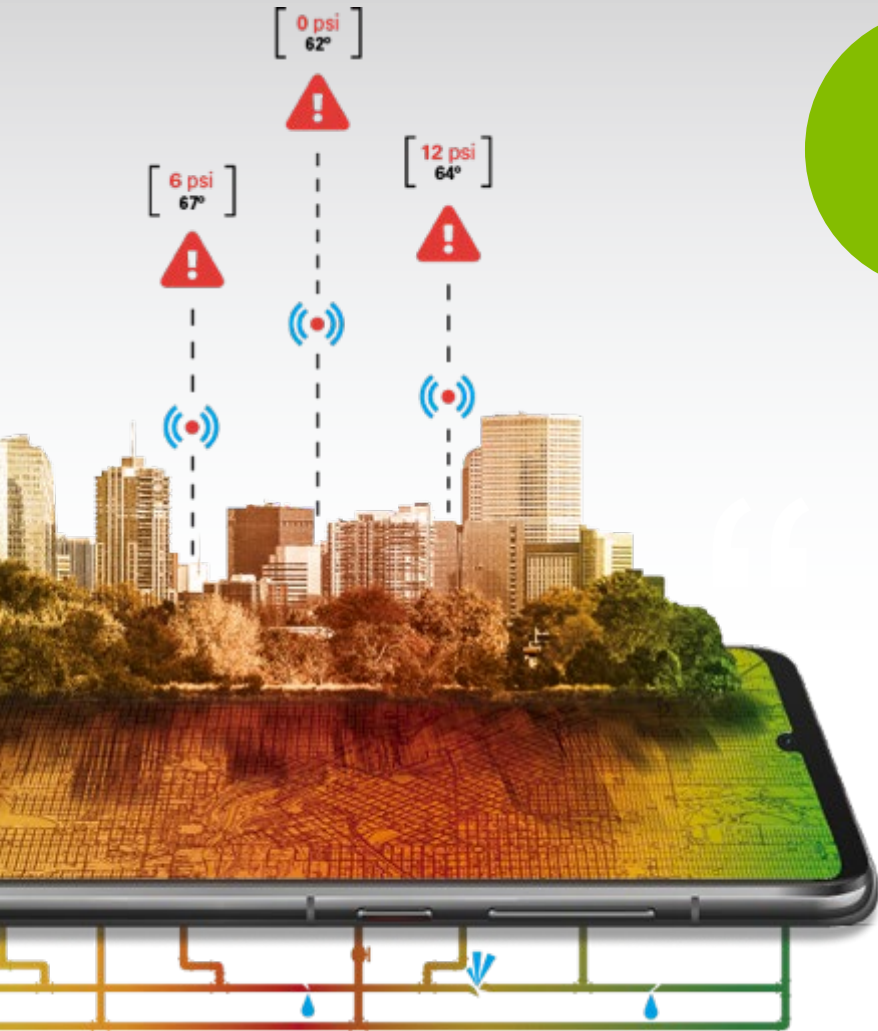
- There is a water main break every two minutes, and an estimated 6 billion gallons of treated water lost each day in the U.S.
- That is 2.19 Trillion Gallons Lost Annually
- The U.S. lost an estimated \$7.6 Billion of treated water in 2019 due to leaks

➤ AWWA Study

- Minor breaks sit in the ground, on average, for a year and a half.

➤ Writing in the journal Nature Sustainability

- An international team of researchers says thieves steal between 30% and 50% of the planet's water supply every year



About the Technology

- ▶ Remote Pressure and Temperature Monitoring
 - ▶ Wet and Dry Barrel Hydrants
- ▶ Robust Hosted Interface
 - ▶ Detailed Records
 - ▶ Alerts
 - ▶ Mapping of Remote Hydrant Monitors
- ▶ iHydrant Return on Investment
 - ▶ Prevents and/or Alerts of Water Loss Events in Real Time
 - ▶ Operational Optimization

UPSTREAM MONITORING

Pressure monitor at Lift Station

Pressure monitor at Pump Station

Pressure monitor at Water Tower

Disinfectant breakdown
w/ high temps

Frozen pipes w/ low
temps

Customer pressure
complaints

Instant main
break notification

PRV Failure

iHydrant DOWN STREAM MONITORING

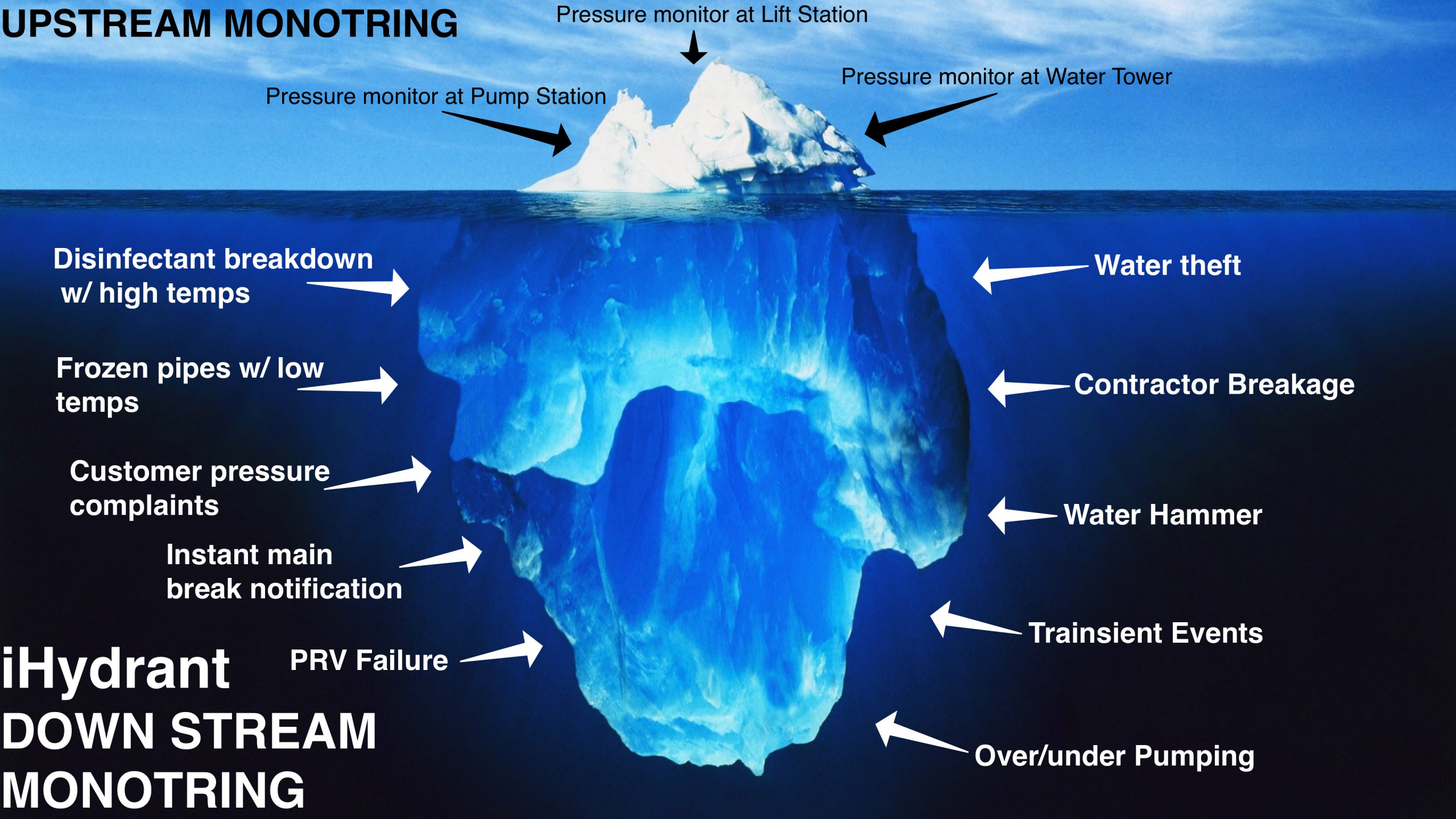
Water theft

Contractor Breakage

Water Hammer

Transient Events

Over/under Pumping





Main break, OR

Benefits & Solutions

- ▶ Reduce Non-Revenue Water and Water Loss
 - ▶ Nighttime main breaks
 - ▶ Water theft
 - ▶ Contractor breakage
 - ▶ 24/7 alerts and alarms
- ▶ Operational Optimization
 - ▶ Pump patterns
 - ▶ Energy cost savings
 - ▶ Line stress and transient – extended life



Installation, NY



Benefits & Solutions

- ▶ Identify and repair/replace malfunctioning valves/components
 - ▶ Actuators
 - ▶ Throttled/broken valves
 - ▶ PRVs
- ▶ Improved customer service
 - ▶ Decrease response time
 - ▶ Water-loss reduction
 - ▶ Reliability of repairs
- ▶ Decrease liability
 - ▶ Road and property damage
 - ▶ Flooding

Benefits & Solutions

▶ Hydraulic modeling

- ▶ Increased accuracy with calibration
- ▶ Data availability

▶ Temperature monitoring

- ▶ Water source optimization
- ▶ Reduce necessary flushing due to water quality

▶ Fire events

- ▶ Pressure availability confirmation
- ▶ Operational performance

iHydrant® impact for LADWP in first 9 months:

- Over 3.5 million pressure samples
- 4,210 pressure alarm events (LADWP defined thresholds)
- 725 alarm events over 200 PSI; 432 alarm events below 30 PSI

Mobile Compatibility

Compatible on desktop, laptop, tablet or mobile device

The desktop view of the iHydrant dashboard is divided into several sections. On the left is a navigation sidebar with options like Dashboard, Hydrants, Bend Zone 3, Bend Zone 4A, High Pressure Zone, Zone 3A (Redmond), Zone 3B (Redmond), and Reports. The main content area includes a 'System Status' section with a 'Warning' indicator, a table of hydrant details, and a 'Fire Hydrants Map' section with a search bar and a map view.

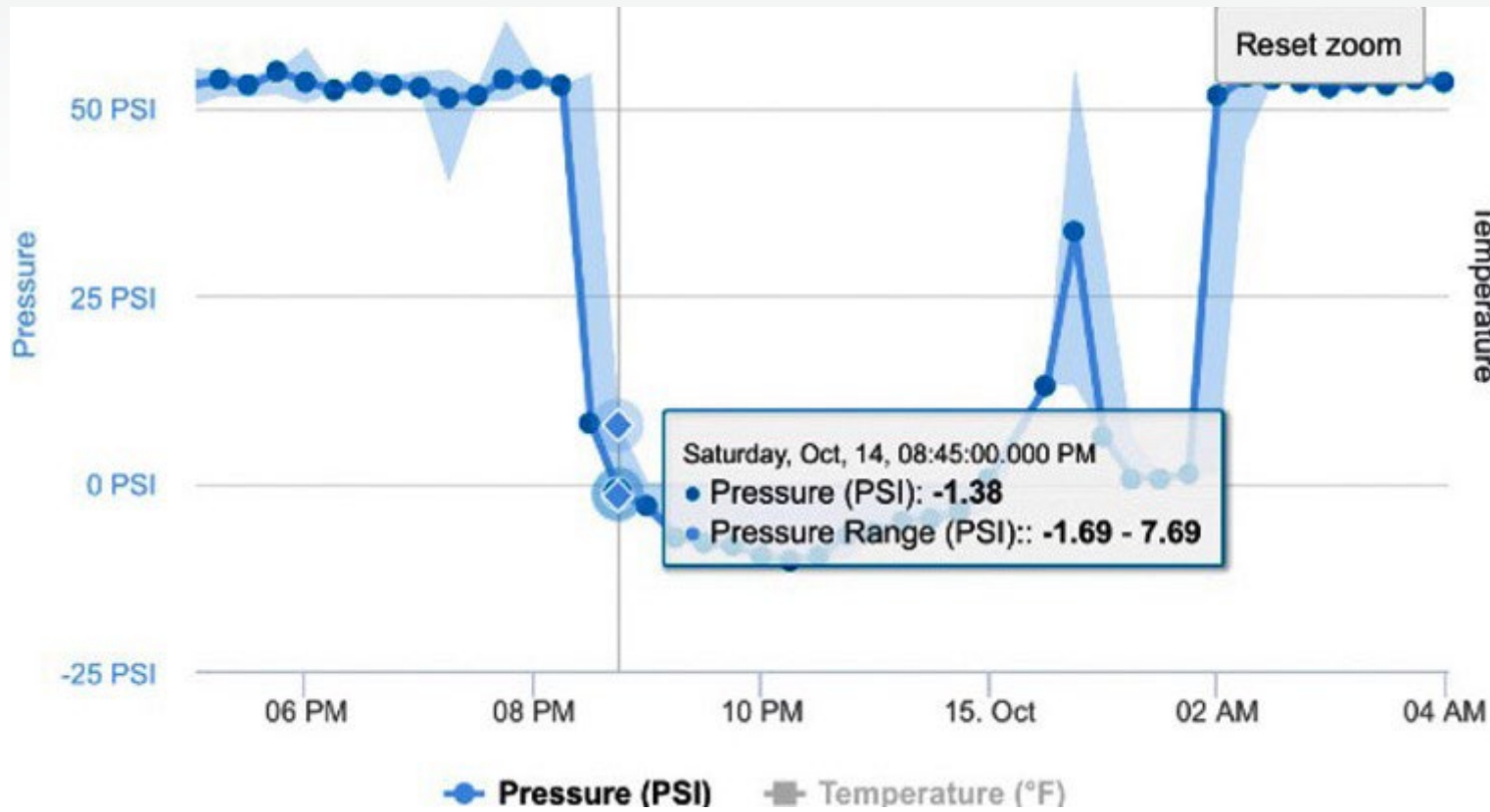
System Status	
System:	Warning
No. of Hydrants:	26
No. of Pressure Zones:	5
Battery Status:	Good
No. of Alerts:	2
Read Success Rate:	96 %

Pinned Fire Hydrants	Status	Low PSI	HI PSI	Low Temp
1 NE 10th St	✓	91	104	45
1253 Northwest Canal Boulevard	✓	74	92	55
1996 Southwest 42nd Street	✓	54	65	34
2844 Southwest Cascade Vista Drive	✓	38	64	46
2921 Northwest 10th Street	✓	101	122	45
655 Northwest Jackie Avenue	✓	76	93	52

Two mobile devices are shown displaying the iHydrant app. The left device shows a desktop-like view with a 'Welcome John Smith' header, a 'System Status' section with 'Normal' status, and a table of hydrant details. The right device shows a mobile-optimized view with a 'Pinned Fire Hydrants' table and a 'Fire Hydrants Map' section.

Pinned Fire Hydrants	Status	Low PSI	HI PSI	Low Temp °F	High Temp °F	System Per
356 Rockaway Boulevard Northeast	✓	67	122	66	72	■■■■
Ark Rd and Viga Rd	✓	56	57	46	46	■■■■
Tierra del oro	✓	69	78	54	55	■■■■

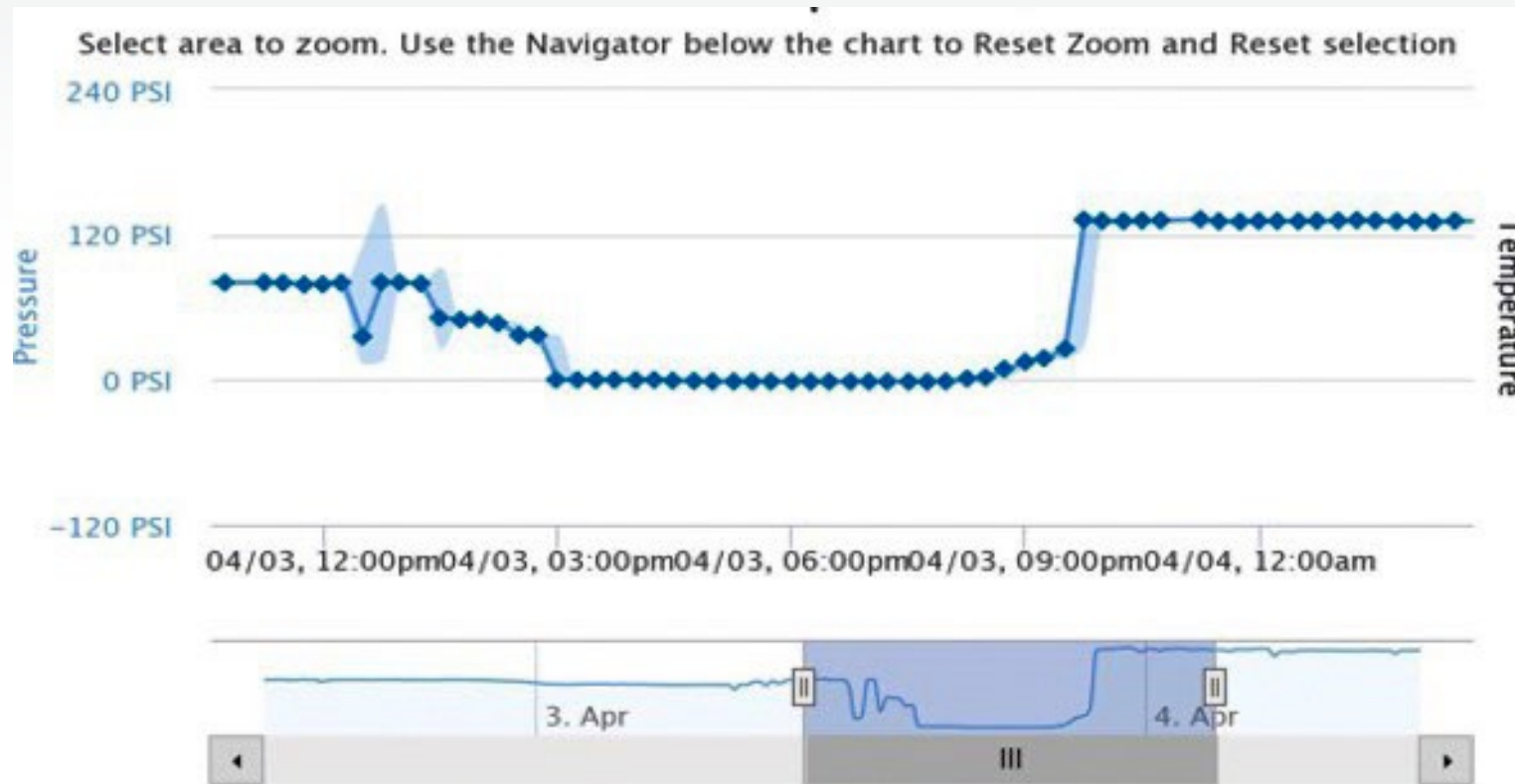
San Francisco Main Break



San Francisco, CA Main Break

Oct 14, 2017, with negative pressure

West Springfield Case Study



West Springfield PRV Failure

April 03, 2020,
PRV failure

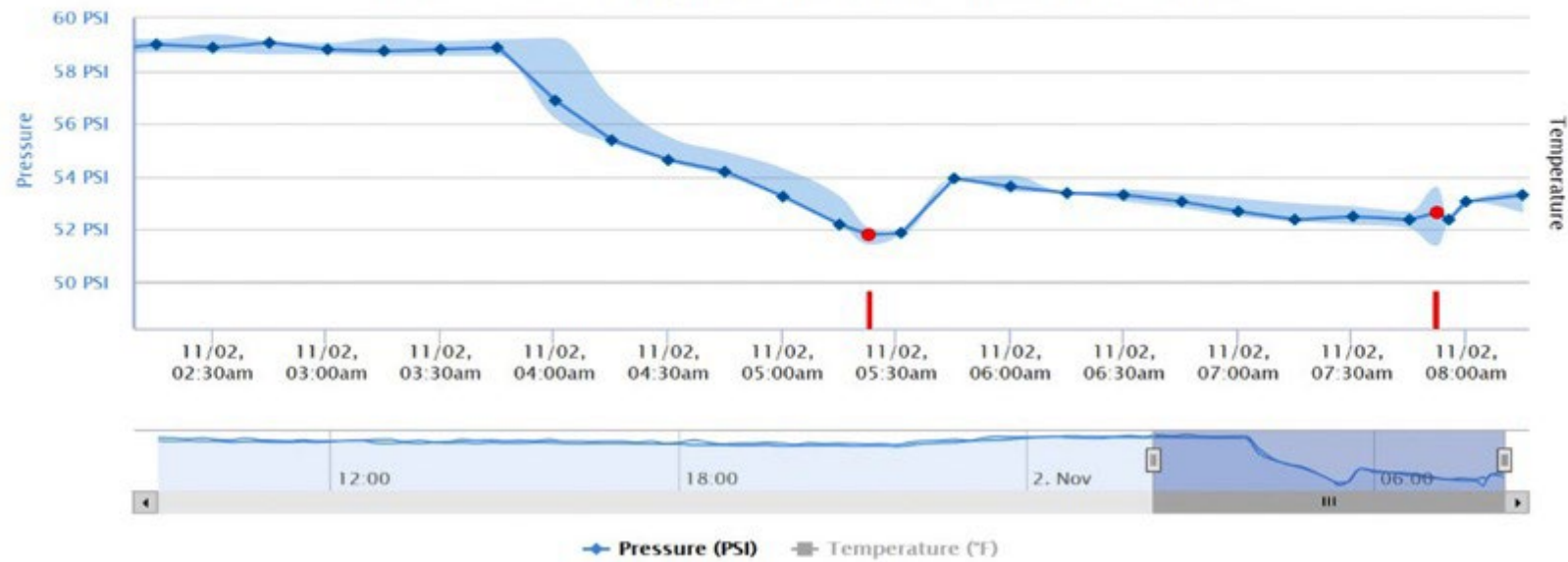
Indiana Main Break

Pressure & Temperature Chart

Select Duration: day(s). Custom Dates

Pressure and Temperature Chart

Select area to zoom. Use the Navigator below the chart to Reset Zoom and Reset selection



About the Technology

▶ Maintenance

- ▶ Battery access

▶ Access Points

- ▶ No digging or tapping
- ▶ No depth limitation
- ▶ Utilizes distribution system components
 - ▶ Existing hydrants – retrofit kits
 - ▶ New hydrant – complete factory kits

▶ Mechanical

- ▶ Sensors located in lower valve plate (dry barrel)
 - ▶ Patented OEM design
- ▶ Normal hydrant operation
 - ▶ No impact to fire department or operations
 - ▶ No reduction in flow

The iHydrant[®] Difference

▶ Accuracy

- ▶ iHydrant +/- 1%

▶ Certifications

- ▶ ULFM and NSF

▶ Alerts

- ▶ 24/7 alerts via text or email

▶ Transient Detection

- ▶ Samples multiple times per second
- ▶ Data captured pre- and post-event

▶ Data Backhaul

- ▶ Zero infrastructure required
- ▶ iHydrant CAT M1
 - ▶ Verizon & AT&T

▶ Expandability

- ▶ Additional batteries
- ▶ Future technology

About the Solution

- ▶ Normal hydrant operation
- ▶ iHydrant installation
 - ▶ No pipeline taps required
 - ▶ Wet barrel – 15 minutes
 - ▶ Dry barrel – 45 minutes



iHYDRANT® | INSTALLATION, LADWP



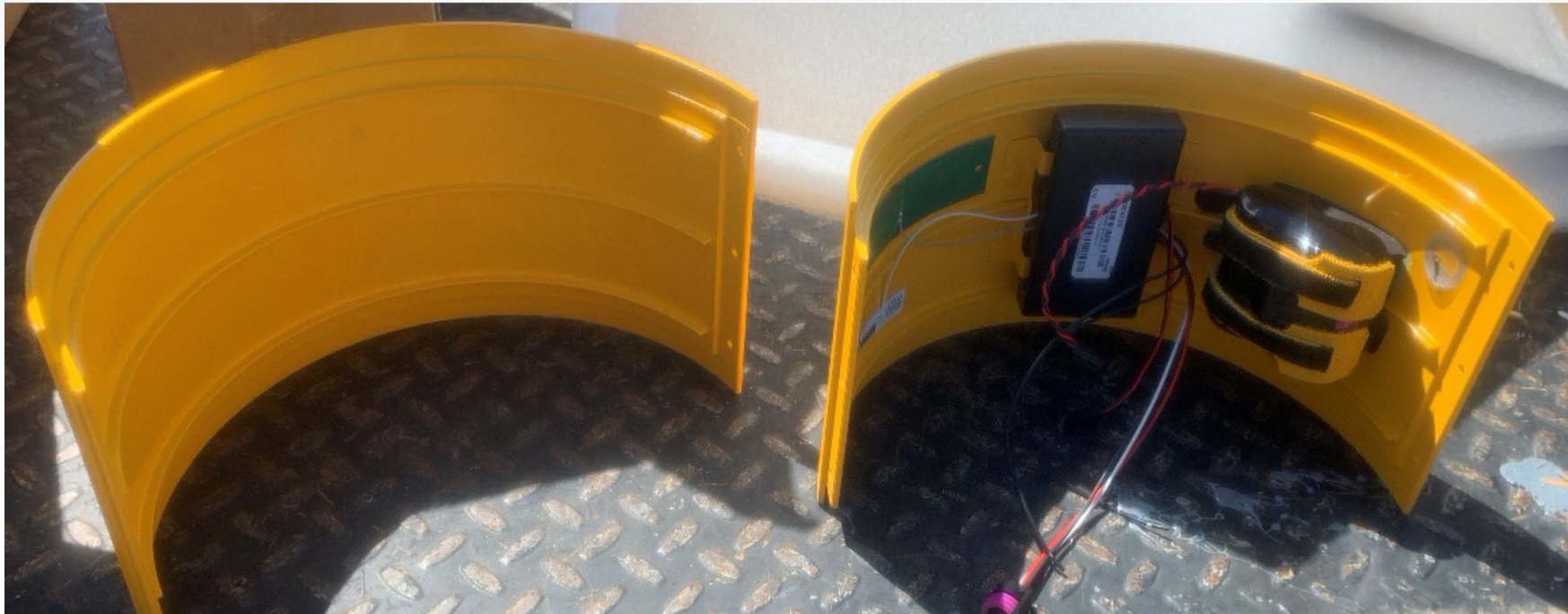
iHYDRANT® | INSTALLATION, VERMONT

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Interior View



iHYDRANT® | INSIDE SHELL VIEW

Data Availability

- ▶ Desktop and Mobile User Interface
- ▶ API
 - ▶ Import into SCADA
- ▶ FTP
 - ▶ Flat file upload

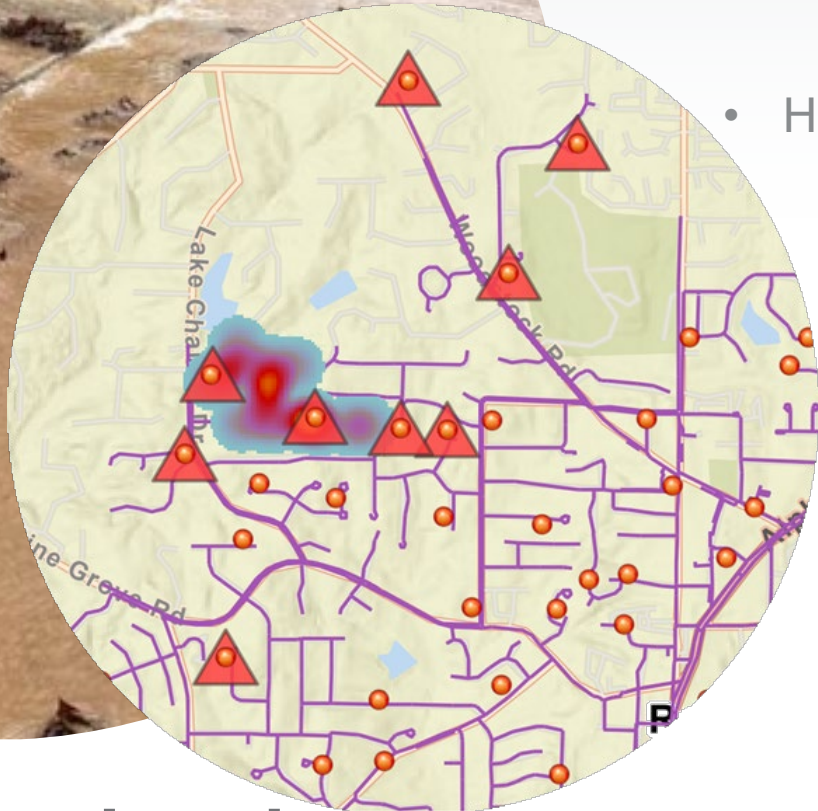


Advanced Software Analytics

Event Detection and Identification

- ▶ Triangulation and pinpointing
 - ▶ Transient detection
 - ▶ Pressure data
 - ▶ Leak detection
- ▶ Leak and pressure data
 - ▶ Shading on map post-event
 - ▶ System troubleshooting for customers
- ▶ Propagation map of system

Heat Map



- How does the Heat Map work?
 - Requires minimum of 3 alarming iHydrants in close proximity to each other to detect an event (full system coverage)
 - Uses time synchronization between the alarming hydrants to triangulate and formulate an approximate area for origination of event



POWERFUL ANALYTICS.
ACTIONABLE INSIGHTS.

Thank you.

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