Wireless Water Leak Detection Systems for Commercial Applications

Presented by: Laurie Conner

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Objectives

At the end of this course, you will be able to:

- Explain why water leak detection is critical in commercial applications
- Identify buildings which are at greater risk for leaks and water damage
- Describe different types of leak detection systems, their advantages and weaknesses
- Discuss the significance of FM approval
- Highlight the basic operation of a wireless leak detection system
- Summarize relevant considerations for a wireless leak detection system to building owners, specifying engineers, and insurance carriers
- Estimate the potential return on investment for a wireless leak detection system

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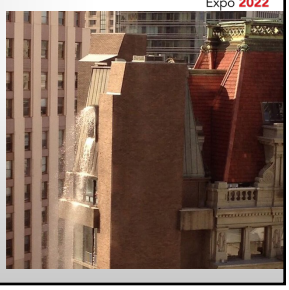
Why Worry About Leaks?

- *#1 cause of property loss claims*
- *Frequency of events and claim cost*
- *Larger than fire and theft combined*
- *Average commercial claim is $90,000*
- *Mold can add 10x to claim*
- *Leaks happen 24/7*
- *Gravity is not your friend*
- *Almost EVERY building will have leaks*



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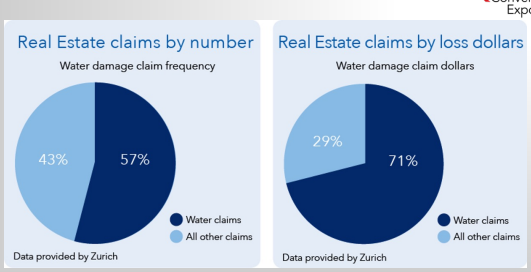
Water Damage Is Costly



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What Happens If You Do Nothing?

- The longer it takes to discover a leak, the higher the costs
  - Bigger clean up
    - Disruption
      - Reliance on someone to notice the leak
        - Tenant health may suffer
          - Not sustainable

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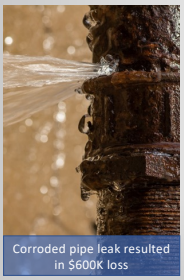
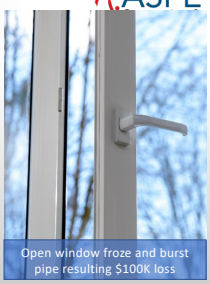
Do Nothing Case Studies


Corroded pipe leak resulted in $600K loss

Abandoned water line break caused $500K in damages


Open window froze and burst pipe resulting $100K loss

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Buildings with Increased Risk for Leaks

ASPE Convention & Expo 2022

LEAK DETECTION

20+ yrs old	New construction	Raised floors	Seasonal extremes	Medical	Multi-tenant residential
Aging equipment prone to damage. Maintenance neglected or deferred.	Shakedown period. Systems installed improperly.	Not just data centers. LEED platinum certification. Hidden leaks.	Exposure to weather extremes, polar vortex. Risk of frozen pipes.	Pharma, hospitals, medical have expensive equipment and irreplaceable samples.	Who is above or below you? With multiple residents, there are more sources of water.

Source: Zurich Insurance, Water Damage Prevention

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Water Sources in Commercial Buildings

ASPE Convention & Expo 2022

- Hot Water Heaters
- Heat Pumps
- Elevator Pits
- Chiller Room
- Pump Room (Domestic, HVAC, Fire, Sump)
- Air Handlers
- Vertical Air Shaft
- Plumbing & Drain Chase
- Electrical MCC Room
- Mechanical Core
- Reheat Circulation Pump
- Sump Pit Overflow
- Tank High Limit Contact
- Server Room
- Sink Cabinet
- Ice Maker
- Coffer Maker
- Scupper

- Floor Drains
- Water Cooler
- Dishwasher
- Toilets/Urinals
- Restroom Sinks
- Drinking Fountains
- Deep Sinks
- Janitor's Closets
- Individual Recurring Water Intrusion Area
- Fire Pre-Action Room
- Eye Wash Station
- Fish Tank
- Soda Machine
- Mechanical Clean Out
- Storm Pump
- Fire Sprinkler
- Boiler Room

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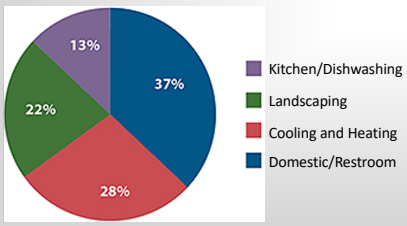
End Uses of Water in Office Buildings

ASPE Convention & Expo 2022



Source: EPA Water Sense

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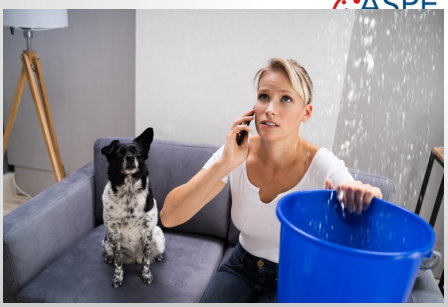
Water Sources in Multi-Family Buildings

- Common Areas (many are the same as for commercial buildings)
- Behind Toilet in Bathroom
- Inside Vanity Cabinet
- A/C Condensate Pan
- Behind Washing Machine
- Behind Refrigerator
- Under Dishwasher
- Inside Kitchen Sink Cabinet
- Hot Water Heater
- Radiator Pan
- Wet Bar
- Basement
- Sump Pump



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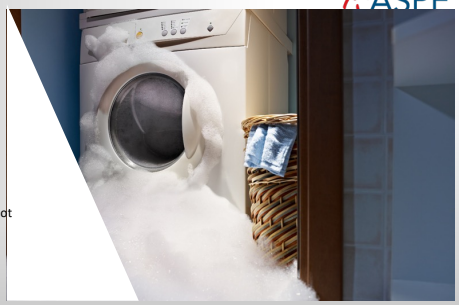
Traditional Solutions

"Screamers"

- ✓ Inexpensive
- ○ Residential
- ○ Not connected
- ○ Must be within earshot



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Traditional Solutions

Long Line Cable

- ✓ Covers large area
- ✓ Good for tight, hard-to-reach areas
- ○ Expensive (3-5 times cost of wireless system)
- ○ Requires power to each sensor

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Traditional Solutions

Flow Metering

- ✓ Appropriate for single family homes
- ✓ Good for sustainability
- ○ Very difficult to detect small drips in large piping systems
- ○ Want to sense water coming out of the pipe, not necessarily flowing through the pipe
- ○ Does not locate leak

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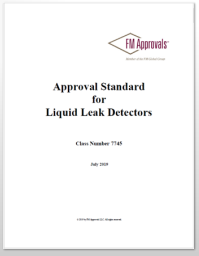
FM APPROVED

"Higher certification standards and product testing mean you'll prevent more losses." – Brion Callori, FM Global Senior VP, Engineering and Research



Approval Standard
for
Liquid Leak Detectors

Class Number 7745

July 2019

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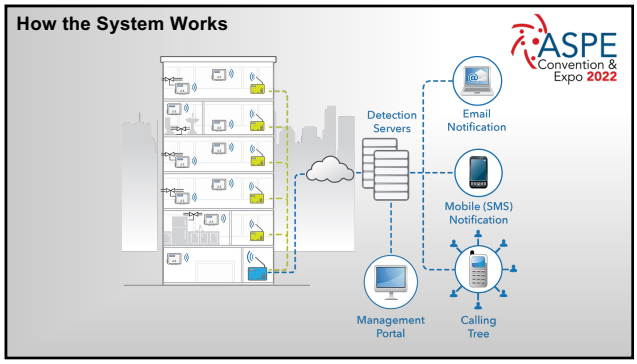
How the System Works
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Detection Servers
Email Notification
Mobile (SMS) Notification
Management Portal
Calling Tree

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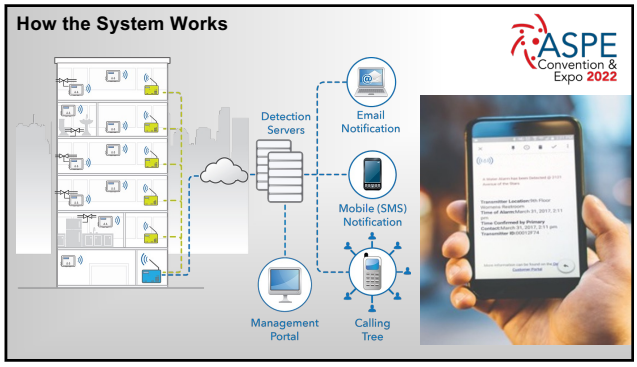
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Cybersecurity
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Isolated proprietary RF network
Endpoints do not communicate out
Uses the latest encryption and security features
Passes security audit
Single point to Internet
Option to disable remote access

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Modular Design

Flexibility

- *Additional sensors*
- *Installs into both older buildings and new construction*
- *Sensing cables*

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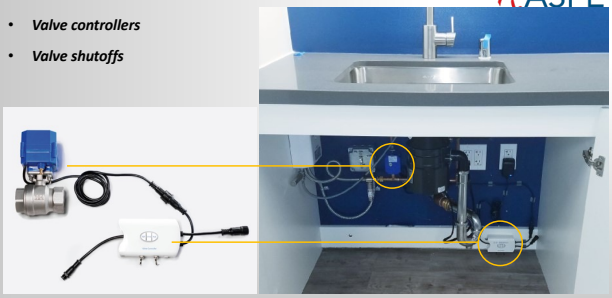
Modular Design

- *Valve controllers*
- *Valve shutoffs*



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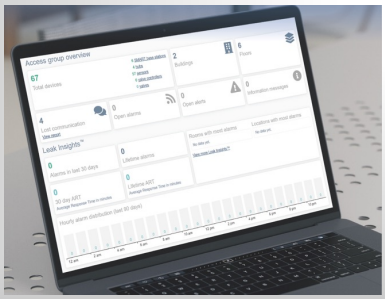
Software Platform Is Highly Configurable



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Alerts and Alarms Provide Precise Location

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Variable Delay Period to Minimize False Alarms

- Gives people time to silence alarm
- Useful in areas where janitors could set it off accidentally with a mop
- Minimizes false alarms
- Event tracked for reporting purposes
- Delay period should be adjustable to the location/situation

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Reliability

- *Long battery life*
- *Internal battery backup for plugged-in devices*
- *Communications backup*

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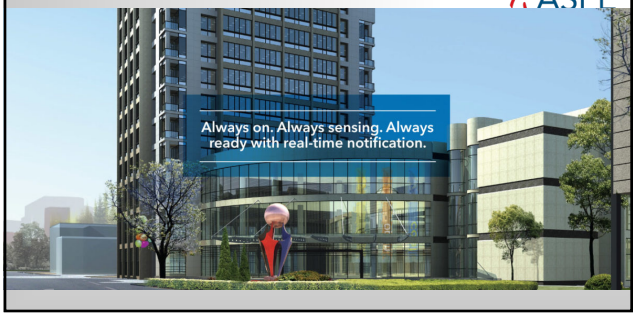
ROI



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ROI for Leak Detection

- Average leak cost ~$25,000/floor
- System cost ~$2000/floor + $480/year
- Example: 10-story building
  - Installation = ~$20,000 + $4,800 = $24,800
  - Software service = $4,800/year
  - ROI = 1 year if you avoid 1 leak!

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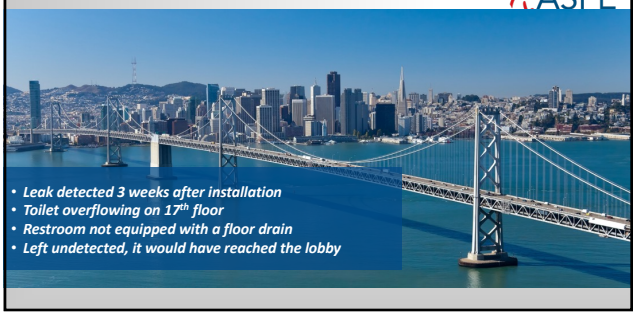
ROI Example



- *Leak detected 3 weeks after installation*
- *Toilet overflowing on 17th floor*
- *Restroom not equipped with a floor drain*
- *Left undetected, it would have reached the lobby*

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Lunch and Learn Objectives

You should now be able to:

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Let us answer all of your water management questions!

Thank you

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