Please, put your cell phones on vibrate during sessions and, take calls to the hallway.

“Counting Every Drop”
Finding and Understanding Water Loss

Welcome!

We’re Glad You’re Here!

Pennsylvania Section
A.W.W.A
About LB Water

VALUE ADDED DISTRIBUTOR
OF WATERWORKS INFRASTRUCTURE PRODUCTS
LOCATIONS

1. Selinsgrove, PA
   870.374.1157

2. Chambersburg, PA
   717.264.8446

3. Ephrata, PA
   717.738.0389

4. Ebensburg, PA
   814.471.1980

5. Stoneboro, PA
   724.376.4625

6. Frederick, MD
   301.874.2560

7. Oakdale, PA
   724.695.2255

8. Richmond, VA
   804.717.2377
The products you need when you need them

- Water Metering Products
- Water Infrastructure Products
- Sanitary Sewer Products
- Storm Sewer Products
- Environmental-Erosion/Stabilization Products

since 1970
Water Utilities are Under Pressure

- Growing demand
- Aging water systems
- Increasing energy prices
Consumer Benefits

- Fewer service disruptions
- Manage water service easily
- Manage water consumption
Why Does it Matter?

In the next decade...

4.6 Billion
Water Stressed

1.8 Billion
Absolute Scarcity

LP Water
What’s it Going to Take?

All players working together...today
The Future of Smart Water Networks
WATER DISTRIBUTION MANAGEMENT
How much water loss is acceptable?

• The acceptable loss in the water industry has been 20% forever.

• Recent estimates put the nationwide cost of lost water at $2.8 billion dollars annually.
• The increasing problem is catching the eye of the general public
Our recent research of utilities has revealed treatment and distribution costs ranging from $1.00 - $4.00 / 1,000 gallons.
What does this translate to?

<table>
<thead>
<tr>
<th>MGD Treated and Distributed</th>
<th>Daily Loss at 20%</th>
<th>Yearly Loss at 20%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>$1.00</td>
<td>$2.00</td>
</tr>
<tr>
<td>0.1</td>
<td>$20.00</td>
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<td>$200.00</td>
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<tr>
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<td>$400.00</td>
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<td>$1,000.00</td>
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</tr>
<tr>
<td>100</td>
<td>$20,000.00</td>
<td>$40,000.00</td>
</tr>
</tbody>
</table>
How do we eliminate the loss?

- Identify Water Loss (Water Audit)
- Implementation of distribution system sub metering
- Implementation of leak detection program
- Pressure Management
What is distribution sub metering?

- A method to meter and track flows through various parts of the system
  - Sub metered flows are compared to source flows and consumption to determine real loss
  - Loss can be identified and responded to on a daily basis
Historic sub metering barriers?
• Installation of insertion electromagnetic meters at critical juncture points in the system
In accordance with Faraday's law, a voltage is induced in a conductor that is moved through a magnetic field. In the electromagnetic principle of measurement, the flowing and electrically conductive fluid represents the moving conductor. The induced voltage is proportional to the flow velocity and is fed to the amplifier by a pair of electrodes on the sensor.
• An insertion magmeter measures a point velocity:
  – Minimum velocity as low as 2 cm/s or 0.065 ft/s (bidirectional) with a given accuracy of:
    +/- 2 mm/s or +/- 0.0065 ft/s
• Economical monitoring solution, used all over the world on drinking and raw water systems:
  – Permanent or temporary installation
  – Pipe diameter range: From 3” to over 120”
  – Ease of installation and use
Installation

• The insertion mag is screwed into a 1” corporation stop before being inserted into the pipe

• Because it is a mag meter it can be installed at any orientation
Sub metering advantage

Using the old “subtract yesterday’s read from today’s and divide by 1,440” doesn’t give us a clear picture of real loss.
Analyzing the same data at 1 minute intervals paints a whole new picture
Crews can now be dispatched into identified area of loss

LOCALIZATION

Acoustic monitoring through leak loggers

Capable of checking the entire distribution network multiple times per year or even daily

No leak detection experience required

No technical skills required – loggers are magnetically attached to valves
Leak or no leak?

“Random Noise”
Higher Intensity
Narrower Spread

“Leak Noise”
Lower Intensity
Wider Spread
Noise loggers can be quickly positioned at intervals throughout the piping network to detect the noise created by leaks. They are easily deployed on valves using magnets and can be placed permanently or moved from site to site with no interruption to water supply.
Acoustic results can now be analyzed.
Localization

And mapped to narrow leak search to street level
Localization

Data retrieval options:
- Latest: Cellular via GPRS!!
The correlation formula

\[ L = D - \frac{(V \times Td)}{2} \]
Pinpointing: Correlation
Pinpointing

Most leaks never surface without a little help!!
Summary

• The acceptable loss in the water industry has been 20% forever
• Nationwide lost water is costing water utilities a fortune
• On going water audits are critical for system health
• Sub metering can track flows on a daily basis in defined areas
• Insertion mag meters are an efficient way to accomplish this
• Monitoring on a minute by minute basis can alert utilities to leakage daily
• Leak position can be rapidly narrowed down to street level through acoustic logging
• Leak position can then be pinpointed to the foot through correlation
• Strategies and technologies are available to stop the bleeding
Performance, performance, performance…

QUESTIONS?