How to Keep Technology Flowing
Making Life Easy for Water Utility Customers

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Deron Austin – Director, Water Management Solutions, Mueller
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Operational Technologies Improve Customer Experience

1. **Water Quality Mapping**
2. Workflow Management & Customer Information
3. Smart Distribution Systems
4. AMI Meters
5. Asset Management
Geospatial View of Sample Results

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Operational Technologies Improve Customer Experience

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Imagine Your Water Distribution Assets... Smarter

- My service pressure is 35 psi.
- There’s a leak inside this home.
- My valve is closed.

- My pressure has dropped 15 psi in the last hour.
- There’s a 100 gpm leak close to me.

- I am partially open.
- Chlorine levels are OK.
- I’m seeking a leak.
- I’ve seen 1,200 gallons of flow in the last hour.

- Chlorine residuals are too low.
- I’m going to flush until chlorine levels are OK.
**Strong Need for Intelligence in Water Distribution Systems**

*Black & Veatch 2018 Strategic Directions in the U.S. Water Industry*

“The true value of digital water emerges when we move from data harvesting to data science. Collecting information is good. Using data to make better decisions and plan for a safe and abundant supply is game-changing.”

**Water Conservation**
- 30% of U.S. experiencing drought or abnormally dry conditions\(^1\)
- 240,000 water main breaks per year\(^2\)
- 27% increase in break rates since 2012\(^3\)

**Non-Revenue Water**
- Up to 30% of treated water is lost or unaccounted for in the water system\(^4\)
- Growing number of states requiring water loss audits\(^5\)

**Customer Service Focus**
- Awareness / Education
- Ongoing monitoring
- Sustainability

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(1) U.S. Drought Monitor as of January 29, 2019 (includes contiguous 48 states)
(2) EPA Aging Water Infrastructure Research Program
(3) “Water Main Break Rates in the USA and Canada: A Comprehensive Study,” March 2018, Steven Folkman at Utah State University
(4) Navigant Research
(5) National Resource Defense Council
## Water Loss & Non-Revenue Water

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<tr>
<th>System Input Volume</th>
<th>Authorized Consumption</th>
<th>Billed Consumption</th>
<th>Billed, Metered Consumption</th>
<th>Billed, Un-Metered Consumption</th>
<th>Revenue Water</th>
<th>Unbilled Consumption</th>
<th>Unbilled Metered Consumption</th>
<th>Unbilled, Un-Metered Consumption</th>
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<td>Leakage</td>
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</table>
Our Solutions to Reduce Water Loss

- **Hydro-Guard**: Flow-based pressure management
- **Singer**: Active leak control
- **Hymax**: Speed & quality of repairs
- **Mueller**: Pipe and asset management

Reduced Water Loss
EchoShore-DX Pilot Deployment by NJ American Water (NJAW)

- 950 Hydrant-based nodes commissioned in 2016 across 6 water systems
- In 2018, NJAW won the NJ Governor’s Award for most innovative technology
- Business Impacts Highlighted
  - **Water Savings:** 1.1 billion gallons of water in the first 2 years of deployment, enough to overflow AT&T Stadium, or serve a community of 30,500 people per day
  - **Financial Return:** Initial pilot paid back in 9 months.
  - **Environmental:**
    - Reduced energy by 3.3 million kWh, or over $400K in energy costs
    - Saved 900,000 kg of GHG, equivalent to removing 170 cars of the road
  - **Social:** Reduced neighborhood disruptions, e.g., repairs scheduled
Why Use Fire Hydrants to Monitor the Distribution System?

- The package is already there
  - We estimate 7 to 10M hydrants installed in the US
- The package belongs to the water utility
  - No additional footprint or infrastructure is required
- In to leaks, we help utilities monitor pressure
Creating Value by Combining Platforms

**Hydrant Cutaway**
- Cellular Hub
- Echoshore DX (leak detection)
- Pressure and other sensors integrated into the main valve and lower stem for water system monitoring without charging the hydrant.

**Smart Stem**
- Bluetooth Antenna
- Batteries
- Electronics (PCB)
- Pressure sensor

**Cellular Hub Bonnet**
- Batteries
- Electronics (PCB) & Cellular antenna
Sentryx™ Water Intelligence Platform

Sentryx™ Water Intelligence outperforms all others. It's the one platform for all the data intelligence you need including water quality, leak detection, pressure, increased security and much more.
Mueller® Smart Water Infrastructure Network

- Pressure Monitoring
- Leak Detection
- Water Quality Monitoring
- Pressure Control
- Water Quality Monitoring
- Remote Disconnect Meter
- Solid State Meter
- Leak Detection
- CIS
- Utility Field Device
- Utility System Monitoring
- Customer Portal
- Network Operations Center (NOC)
- Leak Detection

LoRa Network Collector

Sentryx™ Server
**Operational Technologies Improve Customer Experience**

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Asset Management & Capital Investment

Operating Data
External Data

Risk Assessments
System Master Plans

Capital Investment Plans
Emergency Response Plans
Tabletop Exercises

Asset Investment

Safety and Security
Reliability & Resiliency
Regulatory Compliance & WQ Goals

Infrastructure Renewal
Capacity
Efficiency & Environmental Benefit
Customer Satisfaction & Quality of Service
3D Visualization Models

- Improves safety, O&M
- Reduces construction conflicts
- Public Meetings
Asset Management – Facility Operation

- Proof Of Concept - 2020
- Chemical Safety Sheets
- Training Videos, Manufacturer Information & Manuals
- Improve Response Time
Water Quality
Service
Reliability
Value

Making Life Easy for Water Utility Customers
Audience Questions & Discussion