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Session Title

PCW01 - Emergency Preparedness for Water Utilities: Reducing Risk and Increasing Resilience through Industry Best Practices and Tools
Introductions

Types of Water Utility Emergencies and Real-Life Examples

Leveraging the Incident Command System

Incident Action Checklist Creation

Emergency Response Tabletop Exercise – Part 1

Emergency Response Tabletop Exercise – Part 2

Developing Tabletop Exercises
Q&A

PCW02 - Demystifying Digital Twins - Utility Perspectives
Introductions
Breakout Group Intro Benchmarking
AWWA Survey Results, and Digital Twin Types and Levels
Optimizing Water Utility Functions using Digital Twins
Panel Discussion
Digital Twins Approach and Owner Benefits
The Power of Integration – How to Use the Digital to Manage the Physical
Using Digital Twins to Drive Real-Time Emergency Response
Lessons Learned in Setting Up Digital Twins
Analysis Level Up: New Possibilities Using a Water Quality Digital Twin
Panel Discussion

PCW03 - STI/SPFA Field Erected Steel Water Storage Tank Seminar

Introduction
Review of Aboveground Potable Water Tank Styles

Site Location Selection

Overview of Related AWWA Standards, Manuals of Practice and related guidance documents.

Tank Design, Construction, and Inspection

Coating Systems Selection and Inspection
Overcoat vs. Removal and Replacement of Coating Systems

Maintenance and Asset Management Programs to Optimize Life-Cycle Cost

Q&A

PCW04 - Navigating the Full Lifecycle of a Smart Utility Network

Green Infrastructure in Downtown Portland

On-Site Tualatin Valley Water Infrastructure Program Case Study and Facility Tour

MON02 - Justice and Equity in Infrastructure
Leveraging the Role of Water Utilities to Advance Social, Economic, and Environmental Justice
Justice40 Initiative – Making a Difference
Embedding Equity in the Application of Funding
Q&A
MON03 - Latest Innovations for Asset Managers

MON04 - ICS, SCADA & the Insider Threat: Protecting Water and Wastewater Systems from Threats Within

ICS, SCADA & the Insider Threat: Protecting Water and Wastewater Systems from Threats Within

MON05 - Secure It Right from the Start with Cyber-Informed Engineering

MON06 - Strategic Funding with Federal Dollars

Grants, Grants, Grants – Infrastructure Bill, ARP and Affordable Rates

BRIC Trends and Lessons Learned

Funding for Future Success: Using the Water Infrastructure Bill to Replace Lead Pipes
MON07 - Risked-Based Asset Management

How to Defend and Ensure Value From Your Pipe Risk Model, and Approach 'Optimal' Asset Performance

Dynamic Asset Management Planning at Irvine Ranch Water District

MON08 - 3D Mapping

3D GIS for Facility and Asset Management

Drone Use in Water Infrastructure

3D Technological Developments to Protect Underground Water utilities by acquiring High accurate geospatial data

MON09 - General Energy Management and Optimizing Energy Consumption
What's So Bad About Pumped Storage
Optimizing Pumping Strategies to Reduce Energy Costs While Constrained by Water Quality

ECUA - Water Optimization

Panel Discussion
MON10 - Becoming Cyber Secure

Cybersecurity for Water and Wastewater Systems Critical Infrastructure Sector: Innovative Solutions, Processes and Collaboration

Firmware Under Fire? A Critical Gap in Cybersecurity Programs

Is your PLC Securely Coded? 1 or 0
MON11 - TBD
MON12 - Renew and Replacement

Renewal of Nashville's Grand 8th Avenue Reservoir

A Pilot Project for Mechanical Reinstatement of Service Connections in CIPP Lined Pressure Pipes

Canyon Lake Sewer Rehabilitation Utilizing Trenchless Technologies

MON13 - Decision Support Tools

Data and the Digital Utility – Building the Ultimate Planning and Forecasting Tool

The Decisive Factor: Building a Decision Matrix Dashboard for the City of Houston Surface Water Transmission Program

Utilizing GIS Solutions and Web Applications for Effective Water Project Planning and Enhance Water Data Analysis

MON14 - Finding Your Lead Service Lines

"Get the Lead(Pb) Out" - But You Have to Find It First: An Application of Machine Learning Models

Mapping Lead Service Lines with GIS

How to Create and Validate Your Service Line Inventory
MON15 - Sustainable Resilience

Practical Steps to Developing a Successful Net Zero 2050 Roadmap

Building a Shared City-Community Vision for a Resilient Lower Manhattan

Opening General Session

Opening General Session

North Carolina’s Largest City Prepares for the Future by Assessing Aging Infrastructure and Hydraulic Modeling
TBD
PST01 - Poster Sessions

Energy Recovery Hydropower

Pump Room Ventilation

Leveraging Innovative GIS and Data Collection Systems to Test for Lead in NYC’s Drinking Fountains

TUE01 - Focus Session

Build America, Buy America Requirements for USDA Water and Environmental Programs Projects
TBD - Sponsored Session
TUE02 - Focus Session

Grass Roots Establishment of Service Level Metrics and Targets at Anchorage Water and Wastewater Utility

Leveraging Advanced Analytical Techniques to Convert Pipeline Condition Data into Water and Sewer Capital Improvement Programs
TUE03 - Focus Session

Collective Intelligence: Human-In-The-Loop AI in Water Utilities

More Practical Infrastructure Applications for Machine Learning
TUE04 - Focus Session

The Data Grading Matrix Reloaded: Fresh Insights from AWWA's Water Auditing Tools

100,000 Lead Test Kits, Over 15 Million Data Points - A Tale of One of the Biggest Consumer- Initiated Lead Testing Program
TUE05 - Surviving Natural Disasters: Practical Lessons

Lessons from Recent Severe Weather Events Impacting Water and Wastewater Systems

Crisis Communications in The Instant Information Age: Lessons Learned from The Texas Freeze

From Fire Through Recovery: How Oregon Water Districts Were Impacted and Recovered From the 2020 Labor Day Fires

TUE06 - Exploring Sources of Funding

Funding Capital Projects and Programs for Large and Small Utilities

The Great Juggling Act! Balancing Affordability, Capital and O&M Needs, and Finding Flexibility in Strategic Funding

Conception to Execution: Utilities' Success Assisting Underserved Historical Communities Receiving Modern Water and Sewer Services
TUE07 - Building Seismic Resilience

Earthquake-Induced Ground Deformation Resistance of AWWA Class IV Structural CIPP Lining for Watermains

Installing Earthquake Resilient Water Mains in Constrained Corridors

Improving Seismic Resilience Using Hydraulic Models
TUE08 - Modeling: An Essential Tool

Hydraulic Analysis and Fire Insurance

Modeling at the Speed of Development: Using the Hydraulic Model to Plan a Water System for Rapid Population Growth
Evaluation of Buried Water System Component Conditions Based on Regression Modeling
TUE09 - System O&M

Two Bangs for One Flush: How the Portland Water Bureau Uses Unidirectional Flushing for Distribution System Water Quality and Asse

Line Stops, Valve Insertions, Hot Taps, & Pipe Freezing

Owners Guide to Transmission Main Inspections

TUE10 - Mitigating Risk

Team Resilience - The Human Factor

Mitigating the Risks of Cascading Failures in the Water Sector

Developing and Supporting Effective Security Programs

TUE11 - Proactive Communication Sets the Table for Project Success

Using Today's Communications Landscape to Promote Proposed Infrastructure Efforts and Take Advantage of Federal Funding

Effectively Engaging Stakeholders of a University Community's New Water Treatment Plant Under Design-Build-Operate Contract

Building and Fostering a Community Relationships to Successfully Deliver a Project

TUE12 - Innovations In Asset Management

Get the Lead Out! Or, How to Stop Digging Up Perfectly Good Copper Pipe and Protect the Health of Americans, While Saving Money.

Optimizing a Planned Road Re-Pavement by Performing CA of an Underlying Water Main.

Non-Invasive Pipe Condition Assessment: Is Average Good Enough?
TUE13 - Converting Data into Action

Improving Water Main Capital Planning through a Data-Driven Prioritization Tool

Zero to Hero – Leveraging Existing Data to Implement Asset Management

Real Data = Real Dollars: Using Condition Assessment Data to Prioritize Water Main Renewal and Gain Support for Increased Funding

TUE14 - Modeling Water Hammer Events and How to Keep Them in Check

Avoiding Pitfalls in Transient Modeling

Modeling Transient Controls to Manage System Failure Risks

Challenges in Large Distribution System Transient Modeling

Utilizing Remote Technology and Modeling to Identify Transients and Recover Non-Revenue Water

Are the Results Real? - Validating Transient Models
Panel Discussion
TUE15 - Maintaining Utility Resilience

Emergency Planning -- How to Procure Funding and Keep Plans Current

Developing the Resilient Utility of the Future through Administrative Operation Improvements

Implementing the Water Sector Resource Typing Toolkit
TUE16 - Capital Project Planning and Delivery

Continuing the Debate: Is Master Planning an Art or Science with Tale of Four Medium to Small Utilities?

Preventing Troubled Projects: Selecting and Managing Capital Project Delivery Methods for Project Success

Large Capital Project or Program? Build Your Team and Communicate! Transmission Pipelines Case Study from the WWSP
TUE17 - Pipeline Assessments

A New Method to Assess Bar-Wrapped Concrete Cylinder Pipe

Experience and Innovation on 14 Mile Road - A Case Study for Condition Assessment and Renewal of Large Diameter PCCP

Non-wire Break Related Pccp Failures in Baltimore City

TUE18 - Solving Infrastructure

The Challenges of Failing Infrastructure in Rural Water Distribution Systems

Infrastructure Maintenance and Water Loss Control: Reaching for a Net-zero Carbon Footprint:

Dual Challenges of Portland's Bull Run Filtration Pipelines Project: Minimizing Head loss and Optimizing Flow Control
TUE19 - Designing for Disaster

Dam Emergency Assessment Sensors (IDEAS)

Design of a New Resilient Water Transmission System for the Cascadia Subduction Zone Earthquake and other Seismic Hazards

Hydro Tanks: Averting Disaster

Condition Assessment of Precast Concrete Cylindrical Pipe (Pccp) Using Nondestructive Testing
WED01 - Inspiring Solutions Assest Management Programs

Southeast Michigan Regional Water Infrastructure Asset Management

Ensuring a Successful Asset Management Implementation through a Strong Foundation, Embracing Change, and Engaging the Workforce

Asset Management Leadership From the Nation's Capital
WED02 - Life-Cycle Assessment

Mid Life Crisis for a Pipeline

Corrosion and Aging Water/Wastewater Infrastructure

Separating Fact from Fiction - AWWA D102 Coating Service Life
WED03 - Field-Tested Technology Supplies Real-time Results

An Innovative Solution – How Fort Worth Water Uses Technology in the Field

Beyond Billing: A Survey of the Applications of AMI Based Data for Smart-Water Use Cases

Houston Develops and Implements a Process for Near Real-time Sanitary Sewer Overflow Predictions using Infrastructure Analytics Pl
WED04 - Effective Leak Detection

City of Garland Water Utilities Water Loss Reduction Program – A Case Study

4 MGD, Where Could it Be? How SCADA, GIS, and Modeling tools were used to identify and locate a 4 MGD water loss event

Fort Worth's Real Water Loss Management Plan – What We've Saved, Learned, and How We Progressed to Current Day.

The City of Houston and iHydrant® Work Together to Reduce Non-Revenue Water with Cost Effective Leak and Pressure Data

Minimizing Risk during SmartBall Leak Detection Inspections

What if Your Meters Could Hear What You Cannot See?
WED05 - Effective Resilience Tools

Challenges Extending Earthquake Resilience to Hydrants and Water Services

Portland Water Bureau’s Bull Run Filtration Facility: Infrastructure that Achieves More

Using Insurance as a Tool to Manage Aging Infrastructure
WED06 - TBD

WED07 - Lead Service Line Programs

Lead Pipes: Growing Awareness of a Health Hazard

Lead Service Line Replacement the Newark Way

Navigating the New Normal - A Toolkit for Building an Effective Lead and Copper Rule Program
WED08 - TBD
WED09 - Calculations and Survival

Fire and Floods: Anchoring Bias in Risk Assessment

When Employees Go Rogue, Is Your Scada the Target?
Resiliency - Surviving Mother Nature's Blow

Details

Utilities across the country are affected by a wide variety of disasters. To reduce risk, increase reliability and protect public health, emergency preparedness actions must be taken. Workshop attendees will engage with the incident command system, learn how to create an incident action checklist, and participate in and learn how to

Broad overview of the types of emergencies that
impact water utilities, stories of recent emergencies at water utilities and how they were managed, engagement opportunity for attendees through polls
Overview of the ICS and how water utilities and use
this system to be better prepared during an emergency and coordinate with state and federal response partners, handout with available free online
trainings, example guided development of ICS for a volunteer utility, then group activity where we create an ICS chart for the attendees for upcoming
This session walks attendees through EPA IAC templates available online, then has a breakout session where each group creates an IAC for a specific scenario based on the EPA template.
A curated, guided experience through an emergency scenario that has been
developed by the presenters. Attendees take on their assigned ICS roles and use the IAC developed earlier in the workshop, and step through a guided
emergency response exercise. External agency input (such as primacy agency, health district, emergency
Part 2 will include a hot wash to review how the exercise went
and consider improvement modifications to both the ICS and IAC.
Overview of tools and resources to support attendee to develop a tabletop
exercise for their water utility. Handouts includes reference material for attendees.

This workshop is intended to offer a blend of industry experience and perspectives on digital twins with hands-on sessions to define digital twins and develop a needs assessment for your utility. Workshop presenters will

The STI/SPFA Field Erected Steel Water Storage Tank Seminar for consulting engineers, municipality and utility administrators, and water storage tank owners and operators, covers relevant topics related to steel water storage tanks including a review of tank styles, site selection, an overview of applicable AWWA Standards and Manuals of Practices, tank design and construction, inspection, asset management, and more. This four-hour
An introduction to STI/SPFA and the Field Erected Steel Water Storage Tank Seminar

A review of aboveground potable water tank styles including reservoir, standpipe, and four types of elevated
An overview of considerations when selecting a site location for an aboveground potable water tank including sizing of site, location relative to use, location to other utilities, geotechnical investigations, and access to site.

This session will provide an overview of related AWWA Standards and Manuals of Practice for aboveground potable water tanks, including D100, D101, D102, D107, and M42.
The tank design and construction process will be discussed. Real case studies will be shared as examples for the different aboveground potable water tank styles. The session will conclude with an overview of the inspection process.
An overview of the coating systems selection process including how to select the best coating system for your next aboveground potable water tank project. The session will conclude with an overview of the inspection Considerations for when to overcoat versus when removal and replacement of coating systems is required. Examples will be shared to determine when to select each option.
A discussion of how to properly maintain and manage aboveground potable water tank styles. Examples will be shared to help owners and operators optimize the life-cycle cost of the asset.

Advanced Metering Infrastructure (AMI) can improve utility operations, safeguard financials, and leave room for future monitoring applications beyond meter reading. Benefits include enhanced customer service, reduced truck rolls, and proactive leak detection. This workshop aims to offer a navigation guide to utilities considering Downtown Portland Oregon is home to uniquely designed “green infrastructure” which manages stormwater runoff, cools the air, reduces pollutants, and provides an urban wildlife habitat. This tour, led by a LEED Landscape Architect from the City of Portland’s Bureau of Environmental Services, will feature Large-Scale Green Street Integration which contributes to dependable sewer/stormwater management and aids in watershed restoration. Other highlights include integrated examples of stormwater capture and reuse which reduce the The Tualatin Valley Water District (TVWD) is taking leaps to revamp Willamette Water Supply infrastructure. This on-site session and facility tour offers a unique opportunity for attendees to learn from innovative industry leaders and see their process in action! TVWD’s management program is a framework that allows projects to run efficiently and carry out multiple projects at once including construction of new pipelines (6+) and improvements to raw water facilities. This tour will provide attendees with firsthand knowledge of how TVWD programs are pushing boundaries on design (seismic standards), implementation (creating manageable work pieces and a construction safety program), and developing partnerships (working with their three owning public agencies as well as local city and county). This visit to the Wilsonville site will also reveal raw water facility improvements The Justice40 Initiative was created by the Biden Administration to ensure that Federal agencies working with states and local communities deliver at least 40 percent of the overall benefits from Federal investments in climate and clean energy to disadvantaged communities. The Justice40 pilot program identifies 21 priority programs to immediately begin enhancing benefits for disadvantaged communities. Among the 21 priority programs is EPA’s State Revolving Fund which is the primary funding mechanism for the newly signed Infrastructure Investment and Jobs Act. This presentation will discuss the role of a water utility in promoting TBD

It takes specialized knowledge to compromise or “hack” into a control system undetected, but it does not take specialized knowledge to misconfigure one. Likewise, while some water and wastewater utilities strive to maintain an air gap around their industrial control systems (ICS) networks, air does not stop someone from walking up to obtain direct physical access. Attendees will hear from a panel of experts representing the CERT National Insider Threat Center and two water utility professionals
discuss related concerns and challenges they face and correlating measures their organizations have implemented to reduce the risk posed from
This is a 1.5 hour moderated discussion featuring one expert from the CERT National Insider Threat Center and two water utility professionals with extensive experience in OT/ICS security. Questions will be asked regarding sector and industry specific insider threat use-cases along with accompanying practical steps utilities have taken
Cyber-informed engineering (CIE) is an emerging method to solve cyber risks by thoughtful engineering for industrial control systems. CIE promotes the use of design decisions and engineering controls to eliminate avenues for cyber-enabled attacks reducing reliance on cybersecurity controls. This presentation introduces CIE concepts, delves into engineering principles, and backs up those principles with real-world examples of common
Utilities have a remarkable opportunity to leverage federal funding from the recently established FEMA Building resilient Infrastructure in Communities (BRIC), the American Rescue Plan and Infrastructure Bill to support investment in water projects. With the largest investment in water infrastructure in U.S. history and so much information available, it may be overwhelming to know where to begin your strategic funding journey. This
Utilities have a remarkable opportunity to leverage federal funding from the American Rescue Plan and Infrastructure Bill to support infrastructure projects. This funding includes $55 billion to upgrade water and sewer infrastructure and improve utility system resilience as well as various grant programs. With the largest investment in water infrastructure in U.S. history and so much information available, it may be overwhelming to know where to begin your strategic funding journey. This session will discuss effective strategies for utilities to
Federal resilience and mitigation programs that provide funding for climate adaptation of critical assets and infrastructure are an increasingly important funding pathway for our most pressing resilience needs. The recently established FEMA Building Resilient Infrastructure in Communities (BRIC) Program is an essential new piece in supporting cities, localities, and utilities in their transition towards more resilient and adaptive
With $55 Billion committed to replacing lead pipes under the recently signed Bipartisan Infrastructure Bill, water professionals across the country are witnessing a pivotal moment in our industry’s history. And with the finalization of the EPA’s Lead and Copper Rule revisions, the funding that will be made available to water systems of all sizes will be crucial for ensuring future compliance. 120Water's funding expert, Marcus Hagburg, will share how this new funding can impact your system and walk away with actionable insights you can use to
Risk-based approaches to R&R programs can help utilities prioritize replacement projects for system components that would cause the largest service disruption if those components were to fail. Risk-based asset management approaches incorporate the likelihood of failure (LOF) and consequence of failure (COF) metrics. However, there is no standardized method for determining LOF and COF, so every utility develops its own set of
Howard County is an affluent suburb of Baltimore and Washington DC located in the state of Maryland. The county is home to Columbia, a major planned community of approximately 100,000 founded in 1967. Since many water mains are now more than 50 years old, the County is focusing on developing cost-effective projects to safely extend water main life or ensure 'optimal' replacement using engineering, technology, data collection, and modern analytics techniques. A critical aspect is prioritizing the selection of water main replacement
Irvine Ranch Water District developed a dynamic dashboard application that is updated from GIS and Maximo data to provide a risk-based prioritization of assets for rehabilitation and replacement. These assets are further grouped based on facility and discipline to support development of realistic CIP projects. The dashboards provide a dynamic and flexible analysis capability at each stage of the process, and they facilitated communication with

For over a decade, water and wastewater utilities have been utilizing 3D laser scanning/LIDAR, point clouds, drones, and building information models (BIM) for capital improvement projects, design, and construction projects. This session will provide case studies and technologies which set the pace of dynamic engineering in For over a decade, water and wastewater utilities have been utilizing 3D laser scanning/LIDAR, point clouds and building information models (BIM), for capital improvement projects, design, construction, refabrication projects and to document as-builts/existing conditions of facilities. With recent advancements in technologies, these as-built BIM models can be integrated with the ESRI ArcGIS environment for the purpose of asset management and to enhance field operations. Assets that are inside of a water/wastewater treatment plant that previously could Unmanned aerial systems, more commonly known as drones, have become increasingly relevant within multiple sectors; water and wastewater infrastructure included. From construction monitoring to evaluating the structural integrity of assets, drones have the capability to enhance and supplement the quality of work that engineers can perform in the area of civil engineering. Through the lens of Augmented Reality (AR), B&N will present on the progression of asset management through technology. We will present case studies and
LEARNING OBJECTIVES:

- Ability to map underground gas utilities with advanced technological developments of Gyroscopic mapping probe insertion of the probe into live natural gas pipelines
- Accurately locate buried pipelines to a higher accuracy in X – Y & Z(Depth). Horizontal & Vertical Depth measurements
- High accurate and reliable open platform data that can seamlessly load to any GIS database systems

CASE STUDY:
How can utilities create better energy management practices to reduce greenhouse gas (GHG) emissions and achieve better energy efficiency? Experts in this session will share how different modeling tools and operational strategies can be used to reduce a utility's energy consumption while maintaining operational targets and

New approaches to collaborating with industry, academia, and local infrastructure owners are needed to expedite the development, review, production, licensing, and delivery of goods and services to those who now find themselves on the front line of defending America. Use-cases will be provided for why every organization must at least begin to develop a formal insider threat program along with secure coding of the Programmable Hostile cyber attacks against U.S. critical infrastructure including the Water and Wastewater Systems Sector are becoming more frequent and sophisticated. Current tools are insufficient to protect the water supply. Novel hardware solutions are on the horizon, but bureaucratic hurdles, poor information sharing hamper progress. New approaches to collaboration with industry, academia and local infrastructure owners are needed to According to Gartner, by 2022, 70% of organizations that do not have a firmware upgrade plan in place will be breached due to a firmware vulnerability. When considering securing critical infrastructure, the common approach is to focus on securing IT devices such as servers and network equipment. Using incident response and forensic tools, organizations gain visibility into these devices across four primary areas: network traffic, memory, disk and logs. And while these insights give powerful insights about what happened and when, they fail to cover

Within a control system cybersecurity defense-in-depth strategy, a fundamental component must be the secure coding of the Programmable Logic Controllers (PLCs) within the control system. Many modern utilities rely on PLCs and Supervisory Control and Data Acquisition (SCADA) systems to monitor, control, and automate their critical processes. These processes along with PLCs and SCADA are increasingly networked to allow for remote monitoring, control, and data collection. While designing networks with security in mind is key to protecting networks from cyber threats, solely focusing on the security of the network is not enough to protect control

As infrastructure ages, failures become more frequent, and maintaining service levels becomes increasingly challenging. Utilities must have actionable plans and funding in place to rehabilitate or replace infrastructure to continually meet customer expectations. Attendees will hear the important decision-making involved in rehabilitating both above and below-ground assets.
At 51 million gallons, the 8th Avenue Reservoir is Nashville Metro Water Services' largest finished water storage reservoir and one of its most significant assets. The reservoir was constructed between 1887- 1889 during the Grover Cleveland presidential administration through the contributions of over 750 men working continuously for 30 months. The reservoir is among the oldest continually active water structures in the United States. In recent years, Nashville's urban growth has made apparent that this reservoir would remain a critical part of the AWWA publications provide guidance on the concept of structural classification, which is key to selecting appropriate trenchless rehabilitation technologies for pressure pipes. One such technology is Cured-In-Place Pipe (CIPP). This session will review a new mechanical fitting that can be used to create a watertight service reconnection following rehabilitation of a potable water pressure pipeline with CIPP. A recent pilot project will The Elsinore Valley Municipal Water District (District) is exploring unconventional construction methods to rehabilitate existing sewer mains that are located in challenging locations. Some of the sewer mains are located within public roads and easements that traverse through private properties and provide limited access options for maintenance and rehabilitation. Trenchless technologies will minimize construction costs and disruption to valued customers. The District is able to successfully improve sewer system reliability and reduce inflow and This session will define the data needed to create the digital utility. Utilities that have successfully moved towards becoming digital utilities understand the need for data governance, strong process management, organizational alignment, and proper training of tools. The City of Houston and the City of Chicago used GIS- This presentation will define the data needed to create the digital utility. Utilities that have successfully moved towards becoming a digital utility understand the need for data governance, strong process management, organizational alignment, and proper training of tools. The presentation will also show how the digital utility uses meaningful integrations of key organizational data to eliminate dual entry and streamline processes. The Large diameter waterlines in urbanized areas, with numerous stakeholders, utilities and traffic constraints are not easy to construct. Choosing the right alignment is challenging but can be simplified by collecting data, creating metrics and presenting it on a visually stimulating GIS-based dashboard that can be revised in real-time.

How does the fourth largest city in the United States choose its large diameter waterline alignments when dealing with stakeholders, utilities, and varying urban environments? Is there a method to take multiple project areas with multiple alignment options and sift through the data to provide measurable criteria that identify the Arcadis has developed a modernized way of analyzing and displaying current and upcoming water infrastructure projects, asset data, work orders and progress reports for planning out future projects to the City of Chicago Department of Water Management (CDWM) and the City Council in an effective, transparent, and dynamic solution. The primary objective of this presentation is to provide an overview of how GIS based solutions and web applications has enhanced CDWM in project planning and resource allocation. The presentation also

With new EPA compliance and funding for SL inventory and replacement plans, this session will show how all municipal utilities can use statistics and data science to develop more accurate inventories, create realistic budgets, inform capital planning, and manage public inquiries. Identifying and replacing lead service lines is a lot of work as well as a significant expense. GIS-based applications support field data collection, location of lead service lines, visualizing and analyzing data, and creating easy-to-use resources for the public.
Flint, Detroit, Toledo all know they have lead(Pb) service lines in the ground, which affects public health and public confidence. Yet due to incomplete, inaccurate, and unreliable historical records they have struggled with locating the lead(Pb) service lines as part of a replacement program. Learn how machine learning is a cost-effective approach to identify service line materials. With New EPA compliance and funding for SL inventory and replacement plans - learn how all municipal utilities can use statistics and data science to develop more accurate The Lead and Copper Rule Revision includes an update that requires water systems to identify and make public the locations of lead service lines. Identifying and replacing lead service lines is a lot of work as well as a significant expense. GIS based applications support field data collection, location of lead service lines, visualizing Under the new Lead and Copper Rule revisions, all public water systems must submit an inventory documenting materials of service lines for both publicly and privately-owned LSL material. Creating and validating this inventory will serve as the foundation of your compliance program and access to funding resources. It's important to get it right.

Over the next few months, it will be critical to create your plan and begin building your inventory—but you're not alone. In this session, Rory Billing will walk through different methods to create and validate your lead service line and help you determine the right path for your system including potholing, predictive modeling, lead This session will look at the importance of developing utilities that are sustainable and resilient to climate change. Will highlight how to move from an environmental pledge to a tactical roadmap to reach net-zero with key milestones by the decade that must be achieved. A panel on the pilot test on the Water Utility Business Risk and Opportunity Framework and Guidebook will be included as well as, a case study of New York's efforts to Many utilities have made a commitment toward becoming Net Zero by 2050 but are stalled on turning that pledge into a successful action plan. This session will highlight how to move from an environmental pledge to a tactical roadmap to reach net zero -with key milestones by decade -that must be achieved utilizing existing tools The Financial District and Seaport neighborhoods are at the core of much of New York City's critical infrastructure: the area houses subway lines and stations, ferry terminals, buildings that serve critical economic functions, and areas with a rich history.

Lower Manhattan's shoreline will begin to experience frequent tidal flooding from sea level rise by the 2040s and is also at risk from more frequent and severe storms, like hurricanes and nor'easters. The drainage system will also be increasingly stressed due to the combined effects of increased rainfall and coastal storms, leading to 40 Years in 30 Minutes – Lessons Learned from My Career as a Water Professional. Mark will share observations and insights from his 40-year career in the water industry. His thoughtful perspectives and inspiring stories will provide attendees with relevant strategies to help tackle future water infrastructure challenges.
40 Years in 30 Minutes – Lessons Learned from My Career as a Water Professional. Mark will share observations and insights from his 40-year career in the water industry. His thoughtful perspectives and inspiring stories will provide attendees with relevant strategies to help tackle future water infrastructure challenges.

Charlotte Water, NC, conducted a distribution system study of its central business district which included hydraulic modeling to assist with identifying infrastructure improvements and capital improvement prioritization and budgeting. The study included a hydrant and valve assessment as well as a risk-based assessment using distribution system data and hydraulic modeling results. This presentation will benefit utility or consultant staff charged with CIP development and tracking, as well as hydraulic modelers and planners. Attendees will learn

Energy Recover Hydropower is the installation of hydroelectric generation systems within water delivery networks to recover unutilized energy. Viable applications can be found at system pressure drop locations and power generated from energy recovery projects can be used to offset local demand or exported for profit. This presentation explores the principles of hydroelectric power, covers the technologies currently available for power generation and shows examples of how utilities and groups around the country are implementing
Pump rooms are a vital part in getting clean water to the public and in getting wastewater to be recycled. The motors on these pumps can give off a lot of heat. Heat build up in pump rooms is a bad thing to have because the motors can overheat. Also, it can make maintaining equipment in the room unbearable for staff. Proper ventilation in pump rooms can prolong equipment and keep maintenance staff safe from overheating. This
In May of 2019, NYC Parks retained Woodard & Curran to sample for lead in approximately 3,500 drinking water fountains and other points-of-use at over 950 parks, recreational centers, and facilities across the city. This presentation will showcase the innovative and dynamic system Woodard & Curran developed through a combination of technologies to collect data, track progress, and share results across multiple organizations in near real time, and maintain an aggressive schedule. Expeditiously completing a project of this magnitude would
Focus Sessions are offered as a deeper dive into a variety of subjects and allow extra time for attendee questions.
This Focus Session looks at the Build America, Buy America Act provisions in the Infrastructure Investment and Jobs Act and how they might impact smaller systems in rural communities, with populations of 10,000 or less. With the passage of the (IIJA), all iron and steel products, manufactured goods, and construction materials used on federally assisted infrastructure projects must be domestically produced. These Build America, Buy America
We will describe the Build America, Buy America (BABA) domestic preference requirements for U.S. Department of Agriculture Water and Environmental Program (WEP) water and waste infrastructure projects. All iron and steel products, manufactured goods, and construction materials used on federally assisted infrastructure projects obligated after May 13, 2022 must be domestically produced. BABA supersedes the American Iron and Steel (AIS) requirements, which have applied to WEP since 2017. We will cover WEP's implementation of the

Focus Sessions are offered as a deeper dive into a variety of subjects and allow extra time for attendee
After attending this presentation, attendees will have a general understanding of a LOS framework and the steps needed to develop customer-focused LOS metrics and targets. The presentation will reference how establishing levels of service can maximize utility resources to provide the unique customer expectation of services. This will be accomplished with a case study: The audience will be provided a valuable understanding of AWWU's unique LOS-development approach. The presentation will focus on the benefits of AWWU's approach with discussion of
Complex pipeline inventories combined with the advancement of condition assessment techniques and larger investments into robust asset management software solutions have rapidly propelled the water and sewer industry into an era of "big data". Managing the unknown risk of what, where, when and how a pipe fails can be very complex and have significant ramifications on future levels of service. Knowing when and how to intervene as well as the ramifications of program implementation that deviates from "optimized" solutions due to

One of the foundational components in Intelligent Water is the application of the latest data processing capabitlies. Depending on the application, that could be advanced statistical analysis, machine learning, or predictive analytics. However, some of the strongest data processing capabilities, such as artificial intelligence, are often overlooked due to various reasons. This presentation will take a bottom-up approach to showcasing This presentation will highlight other areas beyond main break prediction to employ machine learning. This will i main break prediction by not only predicting which pipes are most likely to fail but how they might fail to yield a better understanding of consequence of failure. Other opportunities to enhance main break prediction will include effective design of main replacement projects, pressure management and leak detection designed to reduce operational costs. Other areas of interest will include large meter accuracy evaluation, lead replacement

This presentation will focus on the fresh insights provided by AWWA's new Water Auditing Tools. We will briefly highlight the key new features of AWWA's Free Water Audit Software v6.0 (FWASv6), with a special focus on the interactive data grading process which has resulted in a giant leap forward in transparency and clarity for water audit validation. The remaining focus of this presentation will center on the power of data compilation enabled by the (also free) Water Audit Compiler v6.0 which can be used to reveal some key new insights into water audit The City of Chicago Department of Water Management (CDWM) is responsible for providing nearly 1 billion gallons of drinking water each day to the entire city of Chicago and 41% of the State of Illinois. Like many utilities Chicago is also faced with the challenge posed by aging water infrastructure, including the presence of hundreds of thousands of lead service lines. As a part of ensuring good and safe drinking water, educating its residents, and ensuring transparency, CDWM has offered the Chicago residents a free water lead testing program since the

This session will present a series of experiences, lessons, and recommended best practices from recent severe weather and related events impacting water and wastewater systems across the U.S. Weather-related disasters are becoming more diverse and more severe.
This paper will present a series of experiences, lesson, and recommended best practices from recent severe weather and related events impacting water and wastewater systems across the U.S. Weather-related disasters A water provider's ability to communicate during a crisis, whether the emergency involves one neighborhood or its entire system, directly impacts its customers' trust in all of its services. If the provider has a properly-crafted communications plan it can implement quickly, not only are the press and public officials more likely to support the utility during the crisis, but the public will be less likely to be confused and angered by misinformation. The Texas Freeze was an unprecedented crisis in 2021 and the ultimate test of utility COMMS plans. Attendees will Wildfires have increased in frequency and severity over the last 30 years, a trend that is especially problematic in wildland urban interface (WUI) communities. The 2017, 2018, and 2020 fire seasons had particularly devastating impacts to WUI communities in California and Oregon. One particularly devastating effect of these wildfires was damage to and contamination of the water distribution system within the towns of Santa Rosa and Paradise, CA and Detroit, OR. This presentation will summarize the state of Oregon's water distribution systems before the fires and the steps each impacted district took to respond to the contamination measured within their water Every year millions of dollars of state and federal grant money are left on the table each year. Why is this? The simple answer is the process is overwhelming and complicated. This session will explore various sources for funding water infrastructure and which types of projects are most applicable, and how to craft an application Access to clean and safe drinking water is critical for public health and economic development but most of the infrastructure that supports our water is aging and needs repair and development. The financial tension that major infrastructure projects impose on local utilities are more than what they can handle. But every year millions of dollars of state and federal grant money are left on the table each year. How can this be, with large backlogs of projects in every system? The simple answer is the process is overwhelming and complicated. This

We want to do it all, but the reality is there just aren't enough resources. Emerging contaminants, aging infrastructure, equitable service goals, resilience projects, and more have added to the pressure utilities face. This session will present ideas and best practices in how to work towards balancing these pressures and using strategic funding and federal Bipartisan Infrastructure Law (BIL) funding to advance water projects. This means using asset management data to inform capital project scheduling, identifying the right levels of O&M to get the
Many undeserved communities are challenged by aging and inoperable water and sewer infrastructure. The costs to replace wells and septic tanks is often beyond the financial means of the community's residents. The Florida Governmental Utility Authority (FGUA), partnering with Nassau County, Florida, received the first of its kind Federal zero-interest loan and grant funding for a historic, minority community in the state of Florida. The
By incorporating resilience into a risk management framework, a utility can improve its response and recovery strategies, thereby mitigating the potential for loss of service. Infrastructure is vulnerable to earthquake shaking and ground deformation. Planning, designing, and rehabilitating for seismic events, although complex, can save millions. Join experts as they explore considerations for building seismic resilience.
Seismic resiliency of a structural Cured In-Place Pipe (CIPP) for watermains was demonstrated by large-scale fault rupture testing. This CIPP composite is a seamless, circular woven, epoxy-impregnated, continuous fiber fabric. A 11-m long pipeline made of 5 ductile iron (DI) pipe segments was lined with the CIPP. The test imposed an abrupt ground deformation on the pipeline, representative of fault rupture and severe ground deformation, by means the 50°-angle fault displacement on the pipeline buried in a split basin of compacted sand and subjected
Replacing aging water infrastructure with earthquake resilient ductile iron pipe within constrained corridors produces several challenges. Some of those challenges include; where can thrust blocks be installed? Should earthquake resilient ductile iron pipe be used when the water main crosses below other significant utilities? What type of structures should be used to house large mainline valves? Solutions to these questions have been developed and will be expanded upon to provide participants design options that can be used for similar projects
Utilities strive to improve their response to seismic related emergencies, and water distribution modeling can produce critical insights into potential hydraulic conditions during these events. In areas prone to earthquakes, analysis must consider the impact of widespread leakage resulting from a seismic event on system behavior and how this would affect water availability during immediate and long-term recovery efforts. By using advanced

This session will cover hydraulic water model analysis along with GIS and AMI systems and how they can be ideal tools for asset management on new development and updating proposed infrastructure plans and timelines. These tools will help meet the developers, City, and citizens' water needs.
Water engineers generally know that there is a connection between the quality of a water system and fire insurance costs for the municipality. But the details are often murky. This presentation will clarify those
This abstract details master planning and hydraulic modeling efforts for cities in Texas that are experiencing rapid development and population growth. The hydraulic model is a key tool to continuously evaluate the capacity needs to serve new development and perform a sensitivity analysis to size infrastructure large enough to supply the developments and provide system resiliency but not too large to cause future water age and water quality problems. The model can also help expedite design and construction of critical infrastructure to serve
The abstract outlines the issues that arise from condition assessment. There will be a paper provided and a
This session will look at a utility using informed flushing activities, improve water quality, and track assets to provide feedback on the overall condition and operability of its distribution system. It will discuss the basics and advantages of Line Stopping, Valve Insertions, Hot Tapping, & Pipe Freezing. As well as an operator's lessons learned on transmission main assessment.

Unidirectional Flushing is considered an effective means for utilities to remove sediment and loose tuberculation, unwanted tastes, odors, and colored water, as well as a successful tool for assessing asset condition and operability. The Portland Water Bureau expanded their UDF Program in 2018, increasing staffing resources and budget more than 2oo%. The primary goals were to flush 2,300 miles of mains in preparation for the new PWB filtration facility by the fall of 2027 and provide feedback on the overall condition and operability

Will discuss the basics and advantages of Line Stopping, Valve Insertions, Hot Tapping, & Pipe Freezing.

For almost 20 years, the City of Phoenix has dewatered and internally inspected over 120 miles of their water transmission mains between 42- and 108-inch diameter. This presentation will review the lessons learned from over 120 miles of transmission mains assessment from an operator's perspective. A successful program is dependent on extensive planning and detailed department coordination. Some key topics to be discussed are inspection preplanning checklists, strategic system improvements to ensure operational redundancy, the value

Utilities when subject to disaster can make it worse by responding incorrectly. This session will look at how teams can respond with less emotion to disaster, prevent cascading failures to systems, and how developing an

We will begin by presenting the benefits of building a resilient team and explain a little about how the brain works! We will demonstrate simple ways to access internal tools for bringing the body from a sympathetic nervous system stress response into a parasympathetic nervous system rest response, to override stress and signal to the brain to work bilaterally, thereby increasing the ability to problem solve more quickly and effectively. We will engage participants in active demonstrations while keeping it fun and simple to learn.

Water infrastructure has entered a new era of interdependent networked risks. Utility executives are already addressing aging infrastructure in the context of climate and environmental factors, enhanced digitization and cyber security deficits, and supply chain and public health challenges. But interdependencies among water and other networked infrastructure systems can lead to high consequence, cascading failures that are both more severe than the standard hazards. We discuss a novel approach based on probabilistic modeling of the risk of

Our ability to manage risk by mitigation, assumption or reducing, is linked to our ability to design, operate and maintain a viable functioning Security Program. To maintain a viable Security Program, we must understand all

This session will show attendees how to promote utility performance with the press and the public to gain support for their proposed projects for federal funding. By taking a proactive role in promoting and collaborating with stakeholders, utilities highlighted in this session were able to garner support and address hot button issues before they escalated.

2021 was a significant year for the water and wastewater industries, not only because we continued our tremendous performance during the pandemic but because we received long-desired and much-needed federal funding, both through the Covid relief package and the Infrastructure Bill. There has never been a better time to highlight the wide-ranging benefits of replacing our aging infrastructure but, unfortunately, our industry still fails to properly promote ourselves. This presentation will show attendees how to promote its performance with the

When it came time to replace the University of New Hampshire's antiquated water treatment plant, university leaders opted for a design-build contract to construct a larger facility situated above the 100-year floodplain. This process carefully considered the population flux of the service area, the need to balance treatment for three raw water sources, the constant pursuit of energy efficiency, environmental protection with a zero-discharge model, and a place for university students to learn. This presentation will delve into the stakeholder

East Valley Water District is constructing the Sterling Natural Resource Center and expanding the current services offered to the community. To get the project started, the District followed five key steps to develop a

This session showcases advancements in technology with the goal of inspiring innovative thinking in your utility.

This paper discusses how electrical resistance has become a commercially accepted technology to accurately identify lead services in a fast, simple, and low-cost way. By measuring a pipe's change in resistance, operators can confirm pipe materials without disrupting services. Findings by the Water Research Foundation Project #4693, Evaluation of Lead Pipe Detection by Electrical Resistance Measurement, will be discussed, including advances to better identify lead pipes, including copper pipes with lead soldered joints, lined lead pipes, and
This paper describes a unique project, where the plan to repave a road triggered the assessment of a 12-inch Ductile Iron watermain underneath that road. Although the watermain had experienced 9 breaks, the breaks were too localized to conclude that a full replacement was necessary. A subsequent inspection found over 1500 corrosion indications concentrated in certain clusters. The paper shares raw data from the inspection tool, and details the resulting post-inspection rehab decisions. The approach of combining a planned road re-pavement with the assessment of the underlying watermain was deemed so successful that a second watermain was
Our acoustic velocity propagation measurement (AVPM) technology, commercially known as ePulse, to evaluate the condition of potable water pipes is a reliable tool. AVPM is a non-invasive method to measure the average structural condition across a pipe segment, with typical segment lengths of 200-700ft. There is an emerging need for non-invasive solutions that provide pipe wall thickness data over pipe lengths down to 30-100ft, shorter than has been historically attainable with AVPM. The higher resolution data is needed to increase confidence in asset management decisions for specific circumstances. This paper introduces a new and higher resolution, non-
Many utilities have barely scratched the surface of managing their aging infrastructure. Utilizing an asset management tool can provide informed decision-making and help prioritize the rehabilitation of buried infrastructure. Water main rehabilitation affects everyone and using condition assessment data can help benefit those in disadvantaged communities who are generally overlooked in the rehabilitation process.
Greater Cincinnati Water Works has started a project with Arcadis to develop an asset management tool for efficient and transparent decision making over water main replacement. The project includes gap analysis of existing data, setting up level of service (LoS), performing condition assessment (CA), evaluating risks, and converting data evaluation and decision support processes into a non-proprietary software. This presentation focuses on results and lessons learned from the project. It also presents use of Linear Extended Yule Process
Many utilities have barely scratched the surface of managing their aging infrastructure, especially if it's buried. Current supply chain and staffing shortages are placing utilities in need of better scheduling data, but condition data to determine when to prioritize investments can seem difficult to obtain. Fortunately, leveraging existing information and practices can fast-track a condition assessment program. Intent of this paper is to present general concepts to improve system reliability and reduce current and future operation, maintenance, and
Minneapolis has transformed its water main renewal prioritization process into a data-driven program. Condition assessment data has changed the focus from water aesthetics to a quantifiable parameter, fire flow. Water main renewal project areas are prioritized based on concentrations of consecutive hydrants that are below a chosen fire flow threshold. Other factors such as equity and street reconstruction are considered by prioritizing work in designated Areas of Concentrated Poverty where 50% or more of residents are people of color (ACP50) and by
This session will provide practical and technical information about hydraulic transients to operators, designers, and analysts. Attendees will get the basics of recognizing transient potential and the modeling of transient conditions. They will be given tips and lessons learned from experts on simulation techniques and how to
Transient modeling is not like playing video games. Using a calibrated model, transient theory and management must be understood and while appreciating that models are only approximations. Common issues and solutions
This presentation will cover system control procedures to minimize pressure transients, designing surge control equipment/facilities, and informing Likelihood of Failure (LOF) scoring for risk-based system Replacement &
A case study from a comprehensive transient analysis of a very large distribution network using an all pipe model (200K + pipe), closed loop system. Challenges (and nuances) that were encountered during analyses will be
By identifying operational anomalies caused by transients, utilities can proactively and effectively recover non-revenue water, reduce capital expenditures and utilize the data to develop more accurate hydraulic models of

Transient mitigation is a key component of water system design and planning for operational changes. This presentation of transient modeling case studies illustrates how to validate results to provide confidence in the

Utilities that are resilient can lose sight of their goals and become exposed to disasters. This session will look at securing funding to maintain resilience planning, a case study on how to stretch resources, and how to develop Mission Ready Packages to expedite mutual aid requests and facilitate effective emergency response.
Learn how to phrase grant applications to win state and federal funding for resilience planning. Master the art of updating emergency response plans each year to keep staff prepared and easily meet the federal 5-year update
North Texas Municipal Water District (NTMWD) designs and operates the water, wastewater and solid waste infrastructure critical to public health, economic growth and quality of life for the nearly two million customers it serves. In the spring of 2021, NTMWD appointed a new Executive Director/General Manager, Jenna Covington, to steer the District to its future success. This case study with share the administrative operational changes
The objective of this presentation is to overview the Implementation Toolkit for Water Sector Resource Typing (RT Toolkit) that was created to assist agencies with implementing the updated Water Sector Resource Typing Guidance (RT Guidance) and develop Mission Ready Packages to expedite mutual aid requests and facilitate effective emergency response. The RT Toolkit includes step-by-step instructions that provide a comprehensive approach for inventorying and typing resources for local, state, and/or national mutual aid requests. Most

Successful projects have a lot of moving parts and require diligence to overcome a wide array of challenges. This session will explore the use of multi-disciplinary project teams, project delivery best practices, and data-driven planning criteria and evaluations for project success.
This work showcases a case study on how four medium to small utilities, the Cities of Groveland, Mascotte, Montverde, and Bushnell, Florida, each dealt with the classic dilemma of where, when and what to proactively finance and build to promote growth while balancing the immediate demands for modifications and expansions to their water and wastewater infrastructures. Key criteria and evaluations for master planning, permitting, funding and CIP development and implementation will be shared along with how these utilities planned for up to
Occasional troubled projects are the bane of capital project delivery. Based on a review of 50 projects delivered under traditional design-bid-build, construction management, or design-build, this paper provides guidance for optimizing project delivery method selection and managing potential problem areas for project success under
The Willamette Water Supply Program (WWSP) is designing and constructing a new $1.3 billion supply for portions of Washington County (part of the tri-county Portland, OR metro area). When the new system is operating in 2026, customers will be served by an expanded intake facility, a new treatment plant, and over 30 miles of large diameter transmission pipeline. Lessons from two of the WWSP's projects (13 miles of pipeline) illustrate the importance of clear communication, particularly for large projects. Extended, multi-disciplinary

Condition assessment programs, paired with a risk-based approach, help utilities manage assets and work within budget constraints as they evaluate and prioritize infrastructure needs. This session highlights three pipeline assessments that informed renewal and rehabilitation decision-making.
Bar-Wrapped Concrete Cylinder Pipe and C200 steel pipe is similar to C200 Steel pipe in design approach and failure concept. Hence, this paper presents a new concept to assess Bar-Wrapped Concrete Cylinder Pipe using acoustic technology to measure pipe stiffnesses combined with desktop modeling to develop a ratio based on
This study is regarding a failure of Great Lakes Water Authority's 48-inch prestressed concrete cylinder pipe (PCCP) Transmission Main on 14 Mile Road in Detroit, MI. It addresses the condition assessment, renewal and management response plan taken to reduce the likelihood of future ruptures. The presentation focuses on key lessons learned by the condition assessment specialist, highlighting their experience and knowledge, the use of visual and sounding inspection, forensics, manned and free-swimming electromagnetic tools, structural and

Golnaz has a bachelor's degree in chemical engineering and has completed her M.S. and PhD in environmental engineering. Since 2017, she has been overlooking the large transmission main proactive condition assessment
This session will explore the challenges of rehabilitation of infrastructure including case studies of eastern Kentucky water utilities and the possible strategies for addressing problems that affect both design and operations. The Portland Bull Run Filtration Pipelines project is another case study that will be provided speaking on the challenges of designing to maintain a heritage gravity flow system through a new filtration facility. Furthermore, this session will cover the benefits of infrastructure maintenance and how utilizing alternative
For the last five years, researchers at the University of Kentucky have been working with over 50 water utilities in the Appalachian region of Kentucky to address some of the unique challenges of these systems with regard to failing infrastructure, including water loss, water age, and associated water quality problems. This presentation will explore these challenges in the context of several case studies in eastern Kentucky and discuss possible
The reduction of carbon emissions within water utilities has mostly been focused on utilization of alternative energy sources such as solar and wind in addition to combined heat and power using wastewater biogas. This presentation will outline how infrastructure maintenance activities with a focus on water loss control can
The Bull Run Treatment Projects are a multi-year program undertaken by the Portland Water Bureau to construct a new water filtration facility, new pipelines, and an improved corrosion control treatment facility to help the Water Bureau comply with federal Safe Drinking Water Act regulations. The Envision-informed design of the Bull Run Filtration Pipelines, led by Jacobs Engineering, is nearing completion in anticipation of the CM-GC-delivered construction beginning in 2023. This presentation highlights the Bull Run Filtration Pipelines project

Developing systems to protect utilities that are already established is helpful but why not design these utilities with those protections in place. There will be three case studies provided to show how utilities with differing dangers have designed their systems to mitigate disaster.
To allow for better dam safety monitoring and emergency response, The Los Angeles Department of Water and Power (LADWP) conducted a pilot project at Los Angeles Reservoir using different digital sensors. The system includes various types of sensors with data transmitted to the cloud to allow employees to view data online. This system will be set up independent from our existing infrastructure and will send data to the cloud and connect to the Water System's centralized Water Information Network (WIN). The pilot project allows LADWP to test the
The Willamette Water Supply system (WWSS) is a $1.3 billion water transmission system that includes upgrades to an existing river intake including new pumping facilities, over 30 miles of large diameter pipeline, a new water treatment plant with an initial 60 million gallon per day capacity, 15 million gallons of storage, and associated appurtenances. It is located in the seismically active Pacific Northwest region subject to a magnitude 9.0 Cascadia Subduction Zone earthquake and other seismic hazards. The system is designed to be operational
A program was developed to manage the inspection, data collection and rehabilitation/replacement of approximately 400 hydropneumatic (hydro) tanks located within the Tucson Water Distribution system. A complete assessment of the entire hydro tank inventory was needed to mitigate risk of failure as tank failures
The objective of this abstract is to provide the results of recent investigations on pipe systems using innovative non-destructive testing to assess the condition of pipes. A variety of testing methods will be discussed. The results, effectiveness and limitations will be presented in a format that is easy to understand. Testing methodologies and approaches for collecting data from the inside and outside of the pipe that is full and
Water infrastructure represents major capital investments for a community and maintaining the value of that investment is important. Adopting an asset management approach offers utilities a way to make better decisions about budgets and these investments while maintaining levels of service. This session will look at available tools for making these important decisions. Attendees will hear from experts how dashboards, maps, risk-based

The Southeast Michigan Council of Governments (SEMCOG) has completed a new regional infrastructure asset management and capital improvement program that supports the following:

- Understanding the overall condition of drinking water, sanitary sewer, and stormwater linear infrastructure assets in the 7-county Southeast Michigan Region
- Strengthening coordination on infrastructure projects to improve cost efficiencies and reduce inconvenience to the public
- Sharing best practices for asset management programs with the communities, counties, and water agencies in the region
- Developing a regional clearinghouse to summarize regional infrastructure needs

South Platte Renew (SPR) began its asset management transformation in 2019 with a goal of moving from a reactive "fix when fail" strategy to more proactive lifecycle management by developing a strategic improvement roadmap and engaging the workforce. Over the past several years, SPR has been implementing a focused set of high-priority initiatives across maintenance management processes, performance reporting and dashboards, risk-based analysis and planning, and technology and data platforms. Our journey started with critical foundational
This presentation will address the problem DC Gov faced, the unique financial model applied to the multi-billion dollar backlog, and the 'back to basics' approach they took to address people, process, data and technology to support their objective of eliminating their maintenance/replacement backlog by 2026.

Key Takeaways:

- How Bond Rating companies view asset management and financial plans
- The benefits experienced by implementing an approach to understand the degree of the problem and how to invest in remedying it
- How technology supported the District's objective with the appropriate data modeling and capital investment decsion making

Managing assets incorporates a full life-cycle approach, starting with effective planning and design, and continuing through optimized operation and maintenance, appropriate rehabilitation, replacement, and asset disposal. No matter where you are in the life-cycle assessment this session has something for you.
This paper will describe the challenges encountered during the condition assessment and rehabilitation planning for a 60-inch SCCP transmission line serving the the Las Vegas downtown area for over 50 years. The strategy was to isolate small segments of the pipeline to perform internal assessment, but challenges with valve
Investing up front to prevent corrosion has proven to be cost effective. But how does asset deterioration affect performance and what matters most when prioritizing assets? How important is the surrounding medium (backfill versus native soil, concrete, or flowable fill) when determining corrosivity? How does the service of the asset (waste or potable water and pressure or gravity) change the assessment? What unique considerations do different materials and rehab of existing assets require? What is the cost (and difficulty) of repairs to address
This paper/presentation covers the decision making process for engineers and owners on selecting suitable and sustainable coating options for their steel water tanks. The process analyzes a number of data sources (papers, case histories, and performance data) that can be utilized on predicting service life of AWWA D102 interior and exterior coating systems. By combining available data, the predicted service life and performance levels of the

This session will explore how utilities can leverage technologies to do more with less. Fort Worth Water found a unique solution allowing field crews the ability to view, share and create from the field. Where The City of Houston Public Works utilized sensors and predictive technology to prevent Sanitary Sewer Overflows. Advancements in technology continue and as more information is gathered, figuring out how a utility can share this information with field staff is increasingly important. This presentation will discuss how Fort Worth Water found a unique solution allowing field crews the ability to view, share and create from the field.

Advanced Metering Infrastructure (AMI) can help a utility realize many benefits including reduced truck rolls, improved customer service, reduced incidence of leaks and high bills, as well as better meter accuracy. But an investment in AMI can also open-up ways to go 'beyond the meter' in order to enhance modeling and planning, The City of Houston Public Works (HPW) has a sewer network that has a long-standing history of experiencing Sanitary Sewer Overflows (SSO/SSOs). A majority of the Public SSOs are caused by Fats, Oils, and Greases (FOG) that accumulate in the sewer system, restricting the flow rate of the pipe and causing upstream assets to overflow. To track these issues, level sensors will be installed in various manholes throughout the City to monitor flow rate in real-time. This data is then transmitted to a Cloud-based software platform that algorithmically

Detecting leaks have been a difficult fight for the utilities across America. This session will cover the tools that allow for more accurate testing of water mains to find leaks and identify lines that are vulnerable to leaks. Utilizing desktop tools, including SCADA, GIS, AMI, and Hydraulic Modeling to identify, locate and correct a major water loss event and to prevent similar events from happening in the future will be covered as well. This session will provide multiple case studies and how cities are combating leaks to prevent lost revenue and ensure our most valuable resource isn't wasted.
The City of Garland is a municipality northeast of Dallas with a population of 246,000 residents. The City did not have a proactive leak detection program until 2021. The case study will document the program's first year results; 63 leaks found accounting for 0.25 MGD of real water loss, and, the second year results of the ongoing Over one weekend in the Fall of 2021 PA American Water Company experienced a 4 MGD increase in system delivery flow from their Scranton Area Water Treatment Plant. Although a sudden large increase in demand such as this can normally be attributed to a main break, no reports or other typical indications of a large main break, such as visual evidence or impacts to customer service were observed. This is a story of how PAW utilized desktop tools, including SCADA, GIS, AMI and Hydraulic Modeling to identify, locate and correct a major water The Fort Worth Water Department (FWWD) started a proactive survey program in 2007 as component of the 10-year Water Conservation Plan which included a strong water loss component. We will cover in detail how our proactive survey began and developed in to its current state. What worked and what didn't. Where we focused The drinking water industry has increasingly began relying on innovative technology and applications for transmission and distribution system management. Remote technology, specifically pressure monitoring and leak detection, can benefit utilities by providing data that assists with operational optimization of facilities by capturing and alerting the utility to abnormal operational fluctuations in the system. The City of Houston and This presentation will describe all the pre-planning steps that took place to facilitate a successful SmartBall leak detection inspection on the Town of Gilbert Zone 1 Pipeline. This project was unique because it included additional condition assessment testing such as electromagnetic inspections, thrust restraint investigations, corrosion assessment, as well as a design and rehabilitation component. This presentation will help utilities and consultants ensure their SmartBall leak detection inspections are executed efficiently with minimal risk. The Acoustics is used extensively for detecting and locating leaks within a water grid and devices – like listening sticks, correlators, and loggers – all have pros and cons. However, an integrated acoustic sensor housed in the meter presents a simple approach to easily increase the number of acoustic sensors in a water grid tenfold.

Many challenges arise when updating aging infrastructure including preventing impacts seen by disasters. Two case studies will look at the tasks and tools used to make their systems more resilient as well as how insurance can assist in updating infrastructure.

Earthquake resilient water main popularity is growing in areas of extreme risk. In particular, resilience is most popular on transmission or larger diameter water mains. How do you design earthquake resilient water mains to cross an active fault in areas of highly liquifiable soils? How can thrust blocks be designed to maintain expansion capability while not adversely pulling the water system during liquefaction? How do you transition different service types from earthquake resilient piping to existing service at the edge of the right-of-way? How do you
The Bull Run Treatment Projects are a multi-year program undertaken by the Portland Water Bureau to construct a new water filtration facility, new pipelines, and an improved corrosion control treatment facility to help the Water Bureau comply with federal Safe Drinking Water Act regulations. The Water Bureau is capturing this opportunity to meet other resilience goals, along with treatment needs, based on the values of the communities it serves.
This presentation will review the progress of this project, and include lessons learned on balancing goals and
Conference attendees will learn how San Jacinto River Authority utilized asset infrastructure insurance as a mitigation tool to protect water rates, and provide budget certainty for aging infrastructure.

Lead and copper enter drinking water mainly from corrosion of lead and copper-containing plumbing materials. While the use of lead in plumbing materials has been banned for more than a quarter-century, lead pipes are still in many water systems. A core requirement of the lead and copper ruling is to find and replace these service
Greater Cincinnati Water Works (GCWW) has taken a proactive approach to minimizing the risks presented by lead in drinking water, including a longstanding prohibition on installation of lead service lines (LSL) and ongoing lead corrosion control. GCWW has been removing LSLs from the water system since 1971 through a partial LSL removal method in association with the existing water main replacement capital program. Partial replacement of LSLs (public-side only replacement) presents known risks to the customer because the private-side LSL remains in place

The City of Newark, New Jersey has embarked on a multi-step program to mitigate lead in its drinking water.
This presentation will focus on the challenges of managing a lead service line replacement program. Topics to be discussed include utilizing technology to develop a material inventory / prioritization, managing city wide
Drinking Water Act, especially for small systems. The good news is resources and technology are available to ensure water professionals across the country can confidently and effectively develop a successful LCR program.

In this presentation, Lowell Huffman will provide a toolkit rural water professionals can keep in their arsenal to maneuver the complexities of the revised LCR and ensure program success including ways to efficiently build and validate a LSL inventory, 1st/5th liter sampling, and communications best practices.

Risk assessment requires making the best decisions with limited data. Using the correct data, tools, and security measures are critical steps in preventing failures to the system and ensuring a more resilient utility.
Risk assessment often means making the best decisions we can with a limited amount of data about rare events. A common mistake made by people in many situations is to put too much weight on information received early the analysis of a problem. This is called anchoring and may not be the best use of the limited data we have. We
Critical infrastructure is under attack, increasingly by those employed to protect it. This presentation will consider water-specific case studies, key issues, mitigation measures, and available resources.
Descriptive account of utilities using technology to overcome natural disasters to maintain public water supply

Day for Session	Start Time	End Time
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