American Water Works Association ConnecticutSection

ATCAVE February 26, 2019

Red Lion Hotel

100 Berlin Road, Cromwell, CT

Get the most out of ATCAVE 2019 by earning Training Contact Hours (TCH) toward your Connecticut Treatment and Distribution System Operator Certification. Select from tracks in Water Quality and Treatment, Distribution and Storage, or Management. New this year Hydrant Hysteria demonstrations during lunch break.

ATCAVE Vendor Expo

8:00 a.m. – 3:00 p.m.

Location: Grand Ballroom

Join us for coffee/pastries and visit the vendor expo before the morning technical sessions begin. The 2019 Vendor Expo is your chance to see the latest in water supply related technologies and equipment from among dozens of vendors and specialists in the water supply industry. For many attendees, the knowledge gained and the contacts made at the Vendor Expo add significant value to their attendance at ATCAVE.

SESSION A-1: WATER QUALITY AND TREATMENT

2.0 TCH* (.20 CEU)

9:00 AM-11:00 a.m.

Connecticut Department of Public Health: Public Water System Compliance Updates

Christopher Roy, Supervising Sanitary Engineer, Safe Drinking Water Rule Implementation Unit, CT DPH Drinking Water Section

In this session, CT Department of Public Health Drinking Water Section staff will demo the new online monthly operating report portal to submit treatment effluent log data electronically to the DWS. DWS staff will also demo the options to report Surface Water Treatment Rule and Ground Water Rule compliance data using the Compliance Monitoring Data Portal (CMDP). Finally, staff will provide an overview of common compliance issues for public water systems and provide tips on how to avoid them.

Alternatives Analysis for Addressing THMs and HAAs in the Mystic, CT Water System

Lauren Bergman, PhD, EIT, Tighe & Bond
Sarah Keithley, PhD, EIT, Tighe & Bond

Managing disinfection byproduct (DBP) concentrations can be a challenge for Aquarion's Mystic System, which has both surface water and groundwater supplies, two water treatment plants, multiple storage tanks, a distribution system that spans multiple communities, and experiences both Trihalomethanes and Haloacetic Acids. An alternatives analysis was performed, along with system modeling, to determine which treatment options would be most effective in helping the Mystic System meet Aquarion's goals of not exceeding 80% of the DBP MCLs in the distribution system (64 ug/L for Trihalomethanes and 48 ug/L for Haloacetic Acids). Alternatives investigated multiple DBP precursor removal techniques, including implementing PAC and changing pre-oxidation from sodium hypochlorite to potassium permanganate, and DBP removal techniques, such as aeration. A combined DBP control strategies was recommended for addressing the DBP challenges. For the groundwater treatment plant that experiences elevated HAAs, it was

recommended that the pre-oxidation be changed from sodium hypochlorite to potassium permanganate to reduce contact time and overall dose of chlorine. For the surface water treatment plant that experiences elevated THMs, it was recommended that PAC be implemented for DBP precursor removal or that already formed THMs be removed via aeration in one of the storage tanks.

Invasive Species and their Impacts on Water Quality and the Watershed

Joshua Tracy, SCC Regional Water Authority

This presentation will start with describing what an invasive species is, the reasons why they flourish in our woods and on our watersheds, and some examples of the worst invasives and their characteristics. The impacts that invasives may have on water quality and their effects on a healthy forest will also be discussed along with issues surrounding watershed management, such as timber harvests, due to invasives. The presentation will describe how SCCRWA is mapping the invasives on Regional Water Authority property, and some of the management techniques and timings to fight the invasives. Invasive species pose a huge threat to future forests, and a water utility can have difficult challenges in fighting them.

Systemwide Approach to DBP Control

Mike Greeley, PE, Hazen and Sawyer

A systemwide approach to DBP control can minimize overall DBP levels in the distribution system. Modifications to source water storage and withdrawal, treatment plant optimization, and distribution system management can all provide DBP control benefits. An approach which combines optimization of supply, treatment, and distribution will maximize the effectiveness of a DBP control program. This presentation presents case studies of how three utilities made modifications to their supply management, treatment process, and/or distribution system operations to effectively manage DBPs within their distribution system. The evaluation process for each is discussed, followed by eventual recommendations and actual "before and after" data, as available.

SECTION B-1: DISTRIBUTION AND STORAGE

2.0 TCH* (.2 CEU)

9:00 a.m. to 11:00 a.m.

Water Quality Improvement in Water Storage Tanks

Barry Parfitt, PE, Lead Project Engineer, Wright-Pierce
Amanda Ziegler, PE, Lead Project Engineer, Wright-Pierce
Yesher Larsen, PE, Manager, Supply Operations Technical Services, Aquarion Water Co

1. Purpose of Project: Improvement of water quality by TTHM reduction. How mixing/aeration reduces TTHMs and an overview of the removal process.
2. Site Selection: Overview of the distribution system and why mixing/aeration was selected for the Monroe Center water storage tank. The project was designed for phased implementation. Phase 1 would incorporate mixing only for water quality improvement. Phase 2 would involve the installation of aeration equipment for water quality improvement.
3. Design Parameters: Discussion of the various design parameters evaluated for the treatment and product selection. Design factors included evaluating the tank turnover and steady state flow estimation with a pump station for product selection.
4. Product Selection & Design: Review of the manufacturers considered and the various features of each product. The life cycle operational cost was considered for each product and examined as a factor in the selection of equipment.

Discussion of the final system design, including ventilation and mixer installation, and construction challenges and lessons learned

Great Hill Tunnel and Pipeline Restoration Project

Rose M. Gavrilovic, PE, Director of Capital Planning and Delivery, South Central Connecticut Regional Water Authority
Orville A.D. Kelly, Capital Construction Lead, South Central Connecticut Regional Water Authority
Darleen P. Buttrick, PE, Associate, Senior Project Manager, Tighe & Bond

Underground utility tunnels present unique construction and operational considerations that require specific approaches to maintenance, repair and rehabilitation. After a leak was discovered on a 1927 vintage 48-inch cast iron pipe (CIP) that transports raw water from its largest reservoir to a treatment plant which serves over 60 percent of its 430,000 customers, the South Central Connecticut Regional Water Authority (RWA) was faced with a critical, complex and challenging emergency repair that was essentially completed within six months at a cost of approximately $15 million. In this case, restoring a tunnel system, which included a 6'-4" wide by 6'-4" high, 2,700-foot long concrete-lined tunnel, transitioning to the 48-inch CIP was far from routine. An innovative, expedited and specialized solution was needed for the water utility's most critical piece of infrastructure. Emergency repairs to the tunnel system required the design and construction of a temporary bypass system that could handle transporting 40 million gallons of water a day. This bypass system included installing 36,000-feet of above-ground, temporary pipelines from the lake intake, up a 150-foot ridge, down and through an active quarry and reconnecting to existing piping near the existing gate house. The bypass system needed to be operational in order to perform the tunnel restoration and complete the installation of a structural liner on the 48-inch CIP under a 30-foot embankment leading to the quarry's main road and rail system. The leak in the CIP was the result of a diver's weight belt being dropped at the transition from the tunnel to the pipeline some 45 years ago during a lifeline rescue.

This presentation will outline the complex planning, engineering, design and construction of a temporary bypass system and detail the full restoration of the concrete-lined tunnel that was required to swiftly and successfully complete this project. It will also examine the steps that the RWA took to confirm the theory of galvanic corrosion of the stainless steel belt buckle on the cast iron pipe.

Minimizing Metal and Concrete Damage in Water and Wastewater Applications

Randy Nixon, President, Corrosion Probe, Inc.

Understanding the most common corrosion mechanisms that degrade concrete and metals in water and wastewater applications is the first step in preventing the controlling corrosion damage. This presentation explains the most common Mechanisms of metals and concrete corrosion damage in water and wastewater infrastructure and presents successful corrosion mitigation strategies to be used by the utility to maximize the service lives of its infrastructure assets.

SESSION C-1: MANAGEMENT

2.0 TCH* (.2 CEU)
9:00 a.m. to 11:00 a.m.

Implications of Mismanagement of PCB-Containing Building Materials in Water Plant Renovations

Malcolm Beeler, Team Leader, PCB Technical Lead, Weston & Sampson Engineers

Polychlorinated Biphenyls (PCBs) were marketed and sold for use in building materials since the 1950s. The sale of PCBs for use in open systems (e.g., building materials) was discontinued in 1972 but building materials with PCBs were

still available commercially until around 1980. In potable water systems, PCBs may be found in joint sealants (i.e., caulks), asphaltic coatings used on concrete and metal parts and piping, and paints. For plant buildings, PCBs may be found in the same building materials and others (e.g., window glazing and mastics). PCBs are known to have leached from PCB-containing building materials into the building substrates to which they were applied. PCBs-containing building materials on building exteriors are also known to have released PCBs to surficial soil.

In Connecticut, both EPA and CT DEEP regulations apply to the continued use of PCBs in building materials. In general, the continued use of PCB-containing building materials is banned, and the PCB-containing building materials must be removed. Failure to properly plan for PCB-containing materials during the design phase for plant renovations and upgrades can lead to significant budget overruns and schedule delays. In addition, because PCB-containing building materials may not be maintained in place, the decision to sample or not to sample should be evaluated and any sampling performed in a strategic manner. This presentation gives a history of the use of PCBs in building materials and typical materials in potable water systems that may be impacted by PCBs. Also presented is a summary of the applicable EPA and CT DEEP regulations and case studies presenting strategies for complying with these regulations while also minimizing impacts to project schedules and budgets.

Monthly Billing Conversion - Small to Medium Sized Water Utilities

Vincent Tanuis, Assistant Superintendent, Watertown Fire District

The Water industry has historically been slow to adopt new technology and consequently delayed in following some other utility trends. With radio read meters becoming the standard and equipment more readily available, the necessity for a Water Utility to bill on a quarterly basis has been removed and replaced with an opportunity to provide their customers a monthly billing schedule. Prior to radio reading/transmitting equipment, Water Utilities had to issue customer bills on a quarterly schedule in order to read, record, and bill water/sewer usage on time. Operators would walk house to house and record the meter readings in books that would then, once back into the office, be transposed into the billing system by hand. Even after optimizing this process, the labor involved was still far too timely to consider billing each customer on a monthly schedule for a medium sized utility. As technology advanced, manual reads were replaced by touchpads and then radio readers which cut reading times considerably; under the right circumstances, monthly billing became a viable option to many utilities who were operating with a small workforce and sizable customer base. By implementing a monthly billing schedule, water utilities can expect a more streamlined process flow for their billing practices, improved water loss data, as well as a potential reduction in their open receivables.

Case Study-Watertown Fire District (2200 Water Connections):

1. Logistics
2. Finance
3. Website
4. Public Acceptance
5. Lessons Learned

America's Water Infrastructure Act of 2018 – Positioning Your Utility for Long-Term Resilience

Corinne Ketchum, PE, J100, Senior Risk & Resilience Consultant, Arcadis
Marc Delzio, Management Consultant

The Federal Government recently passed Safe Drinking Water Act Updates requiring resilience building actions be taken by community water systems. This is the first time since the Bioterrorism Act of 2003 that similar requirements were in place. Much has changed in the industry since 2003. While some utilities and regulatory agencies have worked to set the curve in building resilience, much of the industry will be playing catch-up to be compliant. This presentation will recap the regulatory updates and provide guidance on industry best practices. The focus will be on steps a water utility can take

to address these new regulations and establish a program for updates every 5 years, as required. The presentation will include a review of where resilience in the industry started, where it is today, a review of standards and guidance documents, how utilities can take an enterprise risk and resilience management perspective, and integration of these activities with other sector best practices like asset management and master planning.

Connecticut Department of Public Health: Important Items and Department Initiatives

Lori Mathieu, Public Health Section Chief, CT DPH Drinking Water Section

Lori Mathieu, Public Health Section Chief of the Department of Public Health's Drinking Water Section, will present on important topics that concern drinking water in Connecticut, and the past, present and future actions of the DPH to address these concerns. Areas to be highlighted include drinking water quality, water supply planning, Lead & Copper Rule 3 years after Flint, Legionella, water system operators and legislative initiatives.

ATCAVE LUNCHEON
11:00 a.m. – 1:30 p.m.

Between the morning and afternoon technical sessions, tour the Vendor Expo, participate in the Vendor Booth Raffles and enjoy the ATCAVE Luncheon Buffet.
Don't miss out on the **Hydrant Hysteria Demonstrations** through the lunch break in the Gardens.

SESSION A-2: WATER QUALITY AND TREATMENT
2.0 TCH* (.2 CEU)
1:30 p.m. to 3:30 p.m.

Little Known Impacts to our Water Supply

Valli Sukuru, PE, Project Engineer, Woodard & Curran

Many of Connecticut's water utilities heavily rely on groundwater sources. The groundwater wells in the state are aging and a significant percentage will reach an age of approximately 50-70 years by 2020. Many drinking water supply wells are located adjacent or in proximity to major and minor river watersheds. Ever-changing climate and regulations will place some of these water utilities who rely heavily on the groundwater in a very vulnerable situation.

This presentation will highlight CT groundwater wells use and history and some of the challenges utilities with groundwater resources would be subjected to in the event of stream flow regulations take into effect for groundwater resources and corresponding river management acts.

Currently the stream flow regulations are applicable to surface water groundwater was not included and the discussion was left for another day. Considering that it takes a long time (3-5 plus years) to put a new well or a back-up well into service, utilities should start their planning now.

Mining Your Water Quality Data Can Be Golden

John Civardi, Mott MacDonald,

Optimizing distribution system water has become an important issue for utilities. AWWA's Partnership for Safe Water Distribution System Optimization considers water quality integrity to be one of the three pillars of the program along with hydraulic and physical integrity.

Utilities such as the Aqua PA Main System generate a significant amount of water quality data for the distribution system. However, valuable information from this data may be inaccessible to the operating staff and remain unutilized.

Routine data review practices tend to be fragmented among various programs and management areas where the data collection differs by sampling locations, sampling frequency, monitoring technique (e.g., online, field, lab) or information system (SCADA, GIS, LIMs, spreadsheets, reports). Comprehensive assembly and review of available data is difficult to perform ad hoc by any utility staff.

Aqua's Main System serves over 350,000 people and includes 4,400 miles of piping, 8 surface water plants, 97 storage tanks and 109 wells. An approach was developed to synthesize available data and develop easily accessible and comprehensible information tools to improve distribution system understanding generally and to facilitate best practices for chloramine residual maintenance.

This presentation will describe the components of an optimized distribution system water quality monitoring program and how Aqua's water quality monitoring program was enhanced to improved distribution system operation.

Comparison of GAC and Ion Exchange Resin Technologies for PFASRemoval

Ryan Fleming, PE, Woodard & Curran

Poly- and Perfluoroalkyl substances or PFAS, have rapidly evolved from their status as lesser-known emerging contaminants in drinking water to become an imminent public health concern affecting drinking water utilities. These chemicals have been manufactured and used in a wide variety of substances for decades, but until recently were largely overlooked by the regulatory community. Now, in the absence of any federal guidance, the Connecticut Department of Public Health Drinking Water Section as well as nearly every other state in the region has put drinking water suppliers on notice.

This presentation will show how a small water utility in New England responded after discovering PFAS in their water supply. Woodard & Curran was contracted to help the town identify and implement a holistic solution. The project had two primary objectives: 1) identify the likely source or sources of PFAS and determine cleanup strategies; and 2) design a treatment system to remove PFAS from the water supply at the point of entry. This presentation will focus on the design process for a drinking water treatment system and will introduce listeners to the types of design considerations that can help ensure initial and long-term project success.

SECTION B-2: DISTRIBUTION AND STORAGE

2.0 TCH* (.2 CEU)

1:30 p.m. to 3:30 p.m.

Connecticut Department of Public Health: DWS Small System Sustainability Efforts

Steven Wallett, Sanitary Engineer 2, Capacity Development Unit, CT DPH Drinking Water Section
Joseph Buehler, Sanitary Engineer, Drinking Water State Revolving Fund Unit, CT DPH Drinking Water Section

This joint presentation will first review the new statutory requirements and technical assistance options for small water systems with respect to asset and financial management planning and hydropneumatic storage tank assessments. Secondly, the DPH DWS will introduce their NEW Small Loan Program with streamlined state and federal requirements for the purchase, installation or replacement of drinking water equipment that costs less than $100,000.

Replacement of Heritage Center Storage tank with Glass Fused to Steel Tank

Justin Keskin, Manager, Aquastore

The Soyuzivka Heritage Center in Kerhonkson, NY replaced a failing welded steel water storage tank due to the cost of repairs in 2018 with an Aquastore glass fused to steel bolted water storage tank. The process began in November of 2016.

The center hired local engineering firm Brinnier & Larios of Kingston, NY to do an evaluation of the tank and do what was best solution for the foundation.

The center is extremely busy in the summer. Seeing as many as 100,000 people over the course of a few days in peak season. This became large factor in the problem of what to do with the only tank in the system. This tank was used not only for potable water but for fire suppression as well. The tank site was at the top of a hill with a tight footprint surrounded by trees and a tool shed. This made temporary storage or trucking in water unlikely and not cost effective.

A number of options were explored, including rehabilitation of the existing tank and a new glass fused to steel tank. Factors such as cost, timeline and seasonal constraints were considered, and will be discussed in this presentation. A glass fused to steel option was selected for implementation, and the new tank is in successful operation.

It's All in the Prep Work: Beverly's Operational Planning Sets the Stage for Tank Painting

Colleen E. Heath, PE, Environmental Engineer, CDM Smith

The 6.3 million gallon Brimbal Tank is the primary water storage tank serving the City of Beverly. This presentation discusses the planning, design, and construction efforts taken by the City to take the tank offline for painting, including utilizing a hydraulic model to assess different operational scenarios while the tank is offline, modifying an existing pumping station with modulating valves for flow control, and coordinating with cellular providers and the FAA in advance of painting mobilization.

Valve Insertion and Line-Stopping Technologies

Stephen Fuller, Strategic Accounts Manage, Harper Haines Fluid Control

Valve Insertion and Line Tapping techniques reduce risks and provide a more productive method of maintaining and repairing distribution systems without complete system shutdown. The benefits of Line Tapping, Line Stopping and Valve Insertion will be discussed in this presentation. Proper application of these techniques and other benefits will also be discussed in this presentation.

SECTION C-2: MANAGEMENT

2.0 TCH* (.2 CEU)
1:30 p.m. to 3:30 p.m.

Supply Flow Meters and Non Revenue Water

Nick Rossi, PE, Operations Engineer, Aquarion Water Company

Aquarion Water Company (Aquarion) relies on hundreds of separate water sources to serve over 625,000 customers across Connecticut, Massachusetts, and New Hampshire. The number of water supply sources presents unique challenges for the management of supply-side flow meters, including regulatory compliance. Aquarion developed a program for the testing, maintenance, and replacement of flow meters with initial results indicating major improvements to non revenue water.

Reduce Non-Revenue Water with Cost Effective Leak and Pressure Data

Tom Bohrer, Vice President of Water Technologies, Nighthawk

Manage your distribution system better. Find out how to be smarter about your distribution system using remote leak detection and pressure monitoring data.

Leak Detection strategies that fit your utility needs and save you money. Advanced Pressure data and fluctuations, including "water hammers", migrate across the distribution system and cause damage. Insights that will allow you to reduce costly main breaks, lower non-revenue water loss and consequential damages by identifying:

- potential pressure-related causes of pipe failures before those failures occur, so that remedial steps can be taken on a preventative basis;
- prevent volume leakage by finding pinhole leaks without false positives --- is it possible and how?
- patterns of temporal or geophysical pressure variations which may be unduly straining the distribution system, or causing or be caused by excessive pumping and related wasteful costs. Discussion on rollout for utilities so that there is low impact to IT or operational staff, and large ROI on investment.

Harness the Power of Data You Already Have

Alan Fabiano, Technology Manager, Contract Operations Group, Woodard & Curran
Jonathan Grant, Practice Leader Intelligent Technology Services, Woodard & Curran

Systems that generate, collect and analyze data are abundant in modern water and wastewater utilities. SCADA, lab data, GIS, CMMS, AMI/AMR, customer systems, and billing systems are just the beginning of the list. But what do we accomplish with that data once it's collected? Do our utilities put it to its best and highest use, or is it collecting dust in a binder on a shelf, sitting unread on a computer hard drive or simply forgotten?

This presentation explores how Woodard & Curran's Operations and Maintenance (O&M) business unit made the conscious decision to embrace the use of technology to harness data generated at the 40+ sites we operate, improving efficiency and effectiveness across the organization. We will discuss how, when intentionally and thoughtfully implemented, GIS systems, work order management processes, process SCADA data, and other sources are combined with the use of business intelligence to reveal new insights and cost saving measures. These insights are not theoretical; we will provide definitive examples of how this technology increased productivity across sites throughout the U.S.

This presentation will also advise how your utility can begin to harness the power of the data you already collect to improve process operations, reduce operating costs and increase the overall effectiveness of your organization. We will show how an assessment will help identify your current conditions and articulate your vision, generating a roadmap to achieve the goal of more effective operations.

Assessment of Granular Activated Carbon and Anion Exchange Resins for Treatment of Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water

Scott A. Grieco, Ph.D., PE, Jacobs

The abstract provides an unbiased comparison of adsorption technologies with a focus on life cycle performance and costs. This is not only important for treatment Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS), but as state-level regulations incorporate drinking water guidance values or limits for additional Per- and Polyfluoroalkyl Substances (PFAS), adsorbent technology selection is critical. This presentation will present current PFAS regulation updates, compare technical performance and projected life cycle costs for different Granular Activated Carbon (GAC) and for Anion Exchange Resin (AEX) based water treatment systems, and discuss integration into existing system infrastructure.

Per- and polyfluoroalkyl substances (PFASs, aka PFCs) related to aqueous film forming foams (AFFF) and a variety of widespread industrial activities have been identified as compounds of interest in drinking water supplies in the US and are generally considered emerging contaminants due to their regulatory uncertainty. Regulatory agencies are actively defining drinking water guidelines, which vary across state and national boundaries due to differences in derivation methodology.

Treatment technologies that are emerging as the most reliable and effective approaches dominantly revolve around sorption, either using granular activated carbon (GAC) or anion exchange (AEX) resins. Several different types of GAC have been tested including bituminous (e.g., coal based) and coconut- shell based, as well as enhanced versions of these media. The assessment of the life cycle costs for each of these competing systems must take into account the engineering design, installation, media costs, operation and maintenance requirements, regeneration carbon footprint, waste disposal and overall longevity of systems. This presentation will summarize available information from published sources, as well as internally-generated data, relating to life cycle costs for GAC and for AEX resin-based water treatment systems.

At the time of publication, DPH Training Contact Hour Applications for technical sessions were pending.

ATCAVE throughout the Day

VENDOR EXPO
8:00 a.m.-3:00 p.m. Grand Ballroom

11:30 a.m. & 12:30 p.m. Hydrant Hysteria Demonstrations-Garden Area

FREE ADMISSION