Chesapeake Section AWWA

6 @ 1/2 -hour Training Sessions

Water Distribution – Part I 10/7/2020: 12:00 – 1:30pm

Monika Blassino, Whitman, Requardt and Associates, and Burak Kaynak, DC Water, *Unique Challenges of Rehabilitation of 66- and 72-inch Watermain in the Heart of District of Columbia*

Evan Andrews, Michael Baker International, and Paul DiMarco, PE, Howard County DPW, *Plan C: When CIPP Lining Fails Under I-95*

Nick Lewis, Gannett Fleming, Inc., *Fullerton: The Construction of 63MG of Finished Water Storage for the Baltimore Water System*

Water Distribution Part II 10/14/2020: 12:00 – 1:30pm

Laura Khouvilay, Carollo Engineers, *Comprehensive Tracer Testing to Validate Modeled Water Age and Support Operations in a Large Distribution System with Multiple Sources*

Pat Burke, Ferguson Waterworks, *Embracing new technologies - Understanding the benefits of AMI*

James LeMire, American Pipe, and Jordan Carrier, Garney Construction - *Large Diameter Water and Wastewater Pipe Constructability*

Bios and Abstracts are on the following pages

Unique Challenges of Rehabilitation of 66- and 72-inch Watermain in the Heart of District of Columbia

Monika Blassino, Whitman, Requardt and Assoc. - *Ms. Blassino is a Professional Engineer in multiple state and District of Columbia, have a master's degree in Civil Engineering, and has over 18 years' experience in the water and wastewater engineering field. Her project experience includes design of wet weather, combined sewer overflow control systems for clients in Maryland, Pennsylvania, and Washington State. She's been involved in a multitude of rehabilitation projects of sewers and watermains utilizing various technologies.*
Burak Kaynak, DC Water - *Mr. Kaynak is a Licensed Civil Engineer and Project Management Professional who specializes in fluid dynamics and buried infrastructure and brings over 8 years of engineering experience across the water and storm water industry. He has managed numerous projects from planning to design, as well as bidding and construction. Projects include water piping design, sewer rehabilitation, water pipe replacement, and storm water hydrology.*

Abstract: DC Water performed internal condition assessment of the 66- and 72-inch watermain located along N Street in Washington, DC. The condition assessment was initiated in 2014 after this watermain was identified as a critical main with a high-risk factor of failure. The inspection consisted of electromagnetic inspection, air pocket survey, and transient pressure monitoring. The inspection indicated eleven locations where the watermain may need rehabilitation due to exceedance of a cracking limit. DC Water initiated a design based on these findings; several rehabilitation methods were considered and vetted and rehabilitation utilizing internal carbon fiber reinforced polymer wrap (CFRP) was selected as the preferred method. This rehabilitation method utilizes high strength carbon fibers saturated in epoxy and requires manned entry into the pipe. The lining is designed to meet specific design requirements, such as the required pressure and loading requirements. Each area requires adequate access and ventilation of the pipeline for manned entry. Additional access areas will be needed for watermain shut down with a double-valve protection to all man-entry areas. Effectively over 28,000 linear feet of watermain will be affected by the shutdown; the watermains affected vary in size from 6-inch to 84-inch. In all, shutdown, recharge and disinfection plans and details had to be developed. Note that this includes over 6 million gallons of water that will be required to complete the required disinfection of the watermain. The project is complicated by the fact that the pipeline to be rehabilitated as well as the shutdown areas are located in a busy District of Columbia corridor. Therefore, the coordination with the District Department of Transportation (DDOT) became the critical item for the success of the project. The permitting associated with the project, particularly traffic control, has lessons learned regarding phasing, design, and contractor's means and methods. The unique challenges of approvals for working within the District of Columbia will be discussed in the presentation. In addition, a unique aspect of this project included the fact that DC Water wanted to add the flexibility to the bid documents to allow rehabilitation of five or more out of the eleven locations, mostly due to funding that is currently available. Therefore, the project would allow for rehabilitation of 5 locations based on the criticality and additional locations if the cost and funding allows it. The pre-construction investigation will include re-inspection of the sites identified in 2014 and ranking them to determine which sites are more urgent for rehabilitation. The project will be structured such that a bid will allow DC Water to identify the sites to be rehabilitated without any additional negotiations with the contractor. This format sets up a unique and complex bid form and measurement and payment. The presentation will share the ways the bid was structured to allow DC Water the required flexibility with minimizing their risk due to skewed bids. The construction is slated to begin in early 2021.

Plan C: When CIPP Lining Fails Under I-95

Evan R. Andrews, PE, Michael Baker - *Evan Andrews is a Project Manager and Professional Engineer with a Civil Engineering degree from Bucknell University. His 34 years of experience includes the planning, investigation and evaluation, design, permitting, and construction of water and wastewater infrastructure. This includes treatment, transmission, and distribution of potable water; and the collection, conveyance, pumping, and treatment of wastewater.*
Paul DiMarco, PE, Howard County DPW - *Mr. Paul DiMarco is a Professional Engineer with 17 years of combined experience in Engineering Design and Project Management. Mr. Di Marco graduated from the University of Maryland in 2002 with a bachelor's degree in Civil Engineering. Paul presently works with the Howard County Department of Public Works, Utility Design Division. He has been with Howard County for over 15 Years and has a primary focus on asset management projects. Mr. DiMarco is currently developing Howard County's asset management program which currently includes Acoustic Monitoring of prestressed concrete cylinder pipe, condition assessment of the County's transmission and distribution using latest industry technologies and the Howard County Corrosion Evaluation Program, which focuses primarily on the evaluation, mitigation, prediction, and prevention of corrosion on the Howard County Water distribution system. Mr. DiMarco's Professional experience also includes the design and construction of water transmission and distribution pipelines, sanitary sewer interceptors and collection systems and water and wastewater pumping stations – all in conformance with the Howard County Master Plan.*

Abstract:
The Montgomery Road 12-inch Water Main Replacement Project in Howard County, MD, included a 475 LF crossing of Interstate 95. This crossing was to use an existing 12-inch main which was to be cured-in-place pipe (CIPP) lined. The crossing is located near a booster station and sees high operating pressures. The lining design called for a Class IV structural liner and incorporates the high operating pressure (153 psi) in the main. The lining system was installed but failed QC leakage testing. The initial response was to access the suspected location of the failure and repair the liner. When the repaired liner failed the leakage test, a new approach was considered. A flexible slipliner (Primus Line) was installed in the CIPP lined pipe which passed the leakage test and is now in operation. This presentation discusses the specification development and construction of the CIPP liner, attempted repair, and the successful sliplining.

Fullerton: The Construction of 63MG of Finished Water Storage for the Baltimore Water System

Nick Lewis, Gannett Fleming, Inc. - *Nick Lewis is project engineer in the water/wastewater group of Gannett Fleming's Baltimore office. For the past 8 years Nick has provided design assistance for a wide variety of projects, including pump stations, water and wastewater treatment facilities, storage tanks, and transmission, distribution, and collection utilities. Nick is a registered professional engineer in the state of Maryland and has served as the chair of CSAWWA's Distribution Committee for the past 3 years.*

Abstract: Baltimore County and Baltimore City are constructing three new finished water storage tanks at the Fullerton Site near White Marsh, Maryland. Constructing these 21 million-gallon water storage tanks is the next step in a plan set forth over 60 years ago to use this site to help improve the finished water supply to the 1.8 million customers in the Baltimore distribution system. Each 300-foot diameter, 40-foot tall prestressed concrete tank incorporates an astonishing 600 miles of prestressing wire and 7,000 cubic yards of concrete. To minimize the visibility of these massive structures, the County opted for flat slab roofs as opposed to domes. Each 8-inch thick concrete roof slab is reinforced with over 150 tons of steel, requiring 180 interior columns for support. The tanks are also fitted with semicircular, concentric concrete baffle walls, providing each structure with clear well capabilities. Once completed, the Fullerton Site will possess the largest finished water storage capacity in Baltimore County. In addition to the storage tanks, the project includes over 3,500 feet of large diameter piping and valves up to 84 inches, a 2,000-square foot disinfection building, and nearly 400,000 cubic yards of earthwork. Close collaboration between the owner, engineer, and contractor was key to orchestrating challenging sequences such as the four-way piping tie in at the Fullerton Pumping Station. This segment needed to be isolated, cut, dewatered, and the new piping installed, tested, and put back in service in under 28 days to limit the shutdown duration of the 34 MGD station. Scheduled to be completed in the spring of 2020, the presentation will highlight the three-year construction contract and the new perspectives obtained and lessons learned, while incorporating some incredible photo documentation and drone imagery.

Comprehensive Tracer Testing to Validate Modeled Water Age and Support Operations in a Large Distribution System with Multiple Sources

Laura Khouvilay, Carollo Engineers - *Laura Khouvilay is an associate with Carollo Engineers. She has over 13 years of experience in the water and wastewater industry and is a leading expert on water distribution systems, including hydraulic modeling, operations, transient analysis, water quality evaluations, criticality assessment, condition assessment, asset management and master planning. She is currently managing the condition assessment for water metallic pipes for WSSC Water and the water master plan for the City of Charleston, SC. Laura is a registered professional engineer in MD, DC, and VA.*

Abstract: Water age is a major factor in water quality deterioration within the distribution system. The AWWARF Study #2769 entitled "Evaluating Retention Time to Manage Distribution System Water Quality" evaluated the effectiveness of using distribution system water age as a tool for managing distribution system water quality. With this is mind, Dallas Water Utilities (DWU) performed comprehensive tracer testing in their distribution system to verify that their hydraulic model is an accurate predictor of water age in their distribution system. DWU also used this opportunity to further examine the area of influence of each of their three water treatment plants and identify blending areas. DWU recently developed an all-pipes Extended Period Simulation (EPS) hydraulic model of their water distribution system. The calibrated model includes 264,254 pipe segments, totaling more than 5,000 miles of water mains. A comprehensive tracer testing program involving 1,085 samples was conducted to validate the water age predictions of the hydraulic model. The field data obtained from the tracer testing demonstrates that a well-calibrated all-pipes model can accurately predict the water age and blending of multiple sources in a large complex water distribution system. This presentation will provide an overview of the development and calibration of the DWU all-pipes hydraulic model, but will focus on the tracer testing program, the comparison between the model water age predictions and the tracer testing water age results, and use of the results to support operations. The findings provide valuable insights into the ability of calibrated hydraulic models, especially large all-pipes models, to predict and analyze water age in distribution systems. As well as the benefits of conducting a system-wide tracer study.

Embracing new technologies - Understanding the benefits of AMI

Pat Burke, Ferguson Waterworks - *Pat started in 2006 with Ferguson and has a very diverse background in supply chain management. He was responsible for the business group's operations and inventory manager for 5 years. In 2014 he moved to municipal outside sales and provide customers with supply chain solutions and respond to 24/7 critical emergencies. Pat is currently on the MD Rural water board of directors, vice chair of the AWWA distribution committee, has won a NUCA of DC member of the year, and a leadership award from the Heavy Contractor's Association.*

Abstract: Technology is advancing all over the world and these improvements are certainly felt in the water industry. One example is the dramatic leap forward in meter reading as a component of a Smart Water System. The US economy loses significant dollars each year due to an outdated water infrastructure and insufficient energy grid. The need for improved asset management, along with better data for combatting non-revenue water challenges are essential to long term sustainability. Automatic Meter Infrastructure (AMI) and Automatic Meter Reading (AMR) systems can come in a variety of forms and offer many benefits to the both the utility and customer. Utility benefits include an increase in customer satisfaction, reduce costs, improved operational efficiencies and conservation analytics. Additionally, it is possible to bolt on technologies for distribution leak detection, pressure monitoring, SCADA pumping data and water quality analysis. Customers can utilize an interactive web portal, which allows them to easily monitor their water consumption, compare current usage to previous periods, configure individual alerts, and set budget and water conservation goals. Overall, it is important to be aware of emerging technologies, such as AMI/AMR and leverage those to gain efficiencies where possible.

Large Diameter Water & Wastewater Pipe Constructability

James R LeMire, American Pipe – *Mr. LeMire has a Bachelor of Electrical Engineering from the University of Texas El Paso. He works in Business Development – AMERICAN Ductile Iron Pipe and AMERICAN SpiralWeld Pipe and is a US Army Veteran.*

Jordan Carrier, Garney Construction - *Mr. Carrier is the Regional Operations Manager for Garney Construction. He has a Bachelor of Construction Management from Eastern Kentucky University, and has been a member of the Water Environment Federation since 2011. His case study publications include: Logan CSO Interceptor Installation beneath an Existing Improved Channel; and Eastern Parkway Water Transmission Main Rehabilitation - Slip lining Renews Critical 48-Inch Cast Iron Main along Historic Olmstead Parkway.*

Abstract: Larger projects have larger issues, larger risks, larger consequences, and larger aspects to every attribute. For that reason alone, greater care and attention should be placed in the planning and preparation of larger diameter projects.

Larger pipe is more often engineered and made-to-order as compared to smaller diameters. Because it is more likely engineered and made-to-order, a single piece can hold up progress on an entire project. Larger diameter pipe generally has longer lead times and slower installation rates. It is often buried deeper. Large diameter pipelines have unique challenges that many who are experienced with smaller diameters may not be familiar with.

This presentation will cover the practical constructability of water and wastewater pipelines 36-inch diameter and larger. Topics to be covered will include material selection, submittal preparation, familiarity of joint types, assembly instructions, creation and use of lay schedules, manufacturing procedures, project management, the importance of known protocols within the team of owner, engineer, contractor, and manufacturer.

The presentation will also include a clear understanding of each stakeholder's role and a checklist used by all stakeholders to minimize risk and consequence and maximize opportunities for success.