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October 2017
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THRIVING IN ISOLATION

Prince Rupert, British Columbia, is tackling a water infrastructure deficit as part of its plan to become the next great port city

PAGE 34

Richard Pucci,
Director of Operations
Prince Rupert, British Columbia

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ON THE COVER: Prince Rupert (British Columbia) Utilities Director of Operations Richard Pucci and his staff are focused on a goal of achieving sustainability and self-reliance by 2030. The strategy includes replacing two critical transmission lines and a 100-year-old dam that holds back the city's primary water source. (Photography by Lonnie Wishart)

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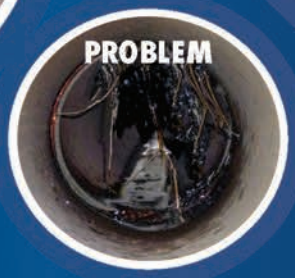

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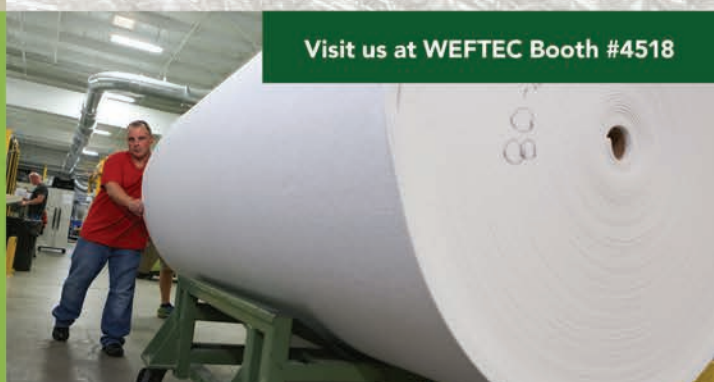

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EMBRACE THE CHALLENGES OF THE DAY

All utilities need to plan for the future, but today is the most important date on your calendar

FROM THE EDITOR

Luke Laggis

Time is a perception. I have a T-shirt that says that. I didn't buy it. I always thought it was kind of stupid, but at the moment, it makes sense.

It's Aug. 8. I'm writing this column on deadline. You won't even see this issue of *MSW* for a couple more months, and by then, I'll be into the new year. Sometimes, it feels like the present doesn't even exist because I'm always working months ahead.

I'm 43. It feels like I started my first newspaper job just a few years ago, but that's far from reality. My mom passed away 12 years ago, but the images and sounds of sitting and talking at her kitchen table are so clear that my mind almost can't accept that it was that long ago. It's easy to lose track. It's easy to look ahead. It's even easier to look back. But working hard, being present and doing everything you can for today is what matters.

Sometimes, it's easy to get caught up in the things you want and need to do tomorrow or next week, or projects you have lined up for the next season. Sometimes, it's a lot easier than being fully present today. The planning process is important at your utilities. You need to study, plan and prepare for projects and initiatives looming on the horizon, but you also need to take the time to make sure everything is running smoothly today.

That's a hallmark of all good utilities. There's always a vision, a plan for system and operational improvement, but there's no sitting back waiting for it to happen. There's no reminiscing or daydreaming — just hard work to improve your communities.

No one is looking back in Prince Rupert, British Columbia. The city, once envisioned by Grand Trunk Railway President Charles Melville Hays as a coastal port to rival Vancouver, is upgrading and modernizing its infrastructure to expand its port and become a major link to Asia across the Pacific Ocean and to Europe through the Northern Sea Route. Hays died on the Titanic, but his vision is still alive, and the city is focused on doing what it can today to turn that vision into a stronger tomorrow.

A little farther to the north, the Anchorage Water and Wastewater Utility is bridging time in its own way. The utility is adding new technology and modernizing a distribution system that they say is one of the most complicated in the world, but they're still drawing water from a glacier. The source is ancient, but the techniques by which the utility is improving its means of distribution — horizontal directional drilling and CIPP — are cutting-edge.

Both utilities have good stories to tell, and both are attacking the challenges of the present to secure their communities' futures.

Solving I&I

You've no doubt noticed the new publication accompanying this issue. *I&I – Inflow & Infiltration Solutions and Equipment* is aimed at helping you with one of the largest and most widespread problems in your collection systems. The cost of inflow and infiltration is staggering, and it's time to address the problem more directly. This magazine is focused solely on I&I and solutions that can save your systems — and money.

I hope you'll find the new magazine helpful and a nice complement to *MSW*.

Enjoy this month's issue. ✦

Comments on this column or about any article in this publication may be directed to editor Luke Laggis, 800/257-7222; editor@mswmag.com.

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OVERHEARD ONLINE

"The ideas of recycling wastewater and capturing stormwater are not new. What's new here is to think about how to combine what had been separate systems into a single approach to recharge groundwater."

— ***Finding Cost-Effective Ways to Replenish Aquifers***
mswmag.com/featured

CANINE SENSES

Dogs Being Trained to Sniff Out Water Leaks

Who needs high-tech equipment to detect water leaks when you can enlist the services of a dog and its highly sensitive nose? A water utility in Western Australia is doing field-testing to see exactly how effective that method can be for identifying leaks in its distribution system, especially in areas where using other methods is more difficult. **mswmag.com/featured**

STORMWATER MANAGEMENT

Blending Green Infrastructure With Street Components

While there are many how-to technical guides on installing green infrastructure, few focus on exactly how to best integrate those features alongside the necessary transportation components on a street. That's why the National Association of City Transportation Officials recently produced its "Urban Street Stormwater Guide." The guide is meant to help transportation planners better coordinate their efforts alongside utilities' stormwater management goals. Learn more in this online story. **mswmag.com/featured**

EQUIPMENT MAINTENANCE

Proper Care of Surveying Tools Ensures Accurate Job Site Measurements

Accuracy is the end game when it comes to surveying a job site. If that information isn't spot on, you're bound to run into problems once it is time to get down to work. That's where caring for your surveying equipment comes into play. A manufacturer of such tools provides some handling guidelines and troubleshooting techniques to keep in mind. **mswmag.com/featured**

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ENGINEERING A STRONGER UTILITY

Martha Tasker's love of science and engineering serves her well as she works to optimize her Kansas community's water systems

By Scottie Dayton

Salina Water Distribution and Waste Water Collection Director Martha Tasker in the utility's water treatment plant. (Photography by Denny Medley)

Drafting and math unlocked the doors to Martha Tasker's future. While studying drafting in college, she worked as a part-time intern at Wilson & Company engineer and architect firm, turning engineers' rough sketches into finished drawings.

The job at the company in Salina, Kansas, became full time after she graduated. By 1980, Tasker was a member of the Environmental Department, where she did concept and design work for many municipalities' water and sewer projects.

Intrigued by what she saw at water and wastewater treatment plants, Tasker borrowed books on their designs, took classes, talked to operators and taught herself to see underground piping in order to draft it clearly.

Her career took off, assisted by mentors Robert Crawford at Wilson & Company, and Don Hoff, director of the Salina Utilities Department. Her aptitude earned her a reputation as one of the best unlicensed engineering managers in the state from the Kansas Department of Health and Environment.

When Hoff retired, he championed Tasker as his replacement. City officials agreed and, after 28 years at Wilson & Company, Tasker joined the municipality in November 2003. She manages 57 Utilities Department employees, who are responsible for the distribution and collections systems as well as water and wastewater treatment plants. She oversees an operating budget of more than $12 million, along with multi-million-dollar capital projects.

In 2016, Tasker was one of five area professionals to receive the Women of Achievement award from the Young Women Legacy Fund. "I never thought about being a pioneer for women in the utilities engineering field," she says. "I'm just passionate about my job and doing it to the best of my ability."

Water for Salina

Salina uses surface and groundwater as source water. Seventeen wells in and around the downtown area (two on standby) deliver 15 mgd. The water is piped to the 20 mgd (design) Salina Water

(continued)

PROFILE:
Martha Tasker, Salina (Kansas) Water Treatment Plant

POSITION:
Director of Utilities

EXPERIENCE:
13 years

EDUCATION:
Drafting degree, Salina Area Technical College

MEMBERSHIPS:
American Public Works Association, AWWA, WEF

GOALS:
Preserve and enhance water quality, ensure future water availability, improve community conditions

WEBSITE:
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Left: A general view of the exterior of the Municipal Waterworks plant in Salina, Kansas.
Below: Plant employee Mark Peterson and Director Martha Tasker examine the chemical feed system provided by Merrick.

Treatment Plant. In emergencies, three more wells south of the city can provide 2 mgd. Water from these wells, part of the former Schilling Air Force Base water system, is chlorinated on site and pumped to the distribution system.

Finished water flows to 1-million-gallon and 2-million-gallon underground reservoirs. Two 200 hp pumps and five 250 hp pumps (all Pentair - Fairbanks Nijhuis) deliver water to five booster pump stations and eight elevated storage tanks, holding a total of 4,075,000 gallons. Water is distributed to more than 20,000 accounts through 330 miles of 2- to 30-inch cast iron, ductile PVC and HDPE pipe.

Easy transition

For Tasker, stepping into Hoff's shoes wasn't difficult since she had worked with many city employees while at Wilson & Company. Nevertheless, there were adjustments.

"One big change was leaving the private sector for the public sector and having 47,000 bosses," says Tasker. "Another change was the unpredictability of each day. At Wilson & Company, I planned every day and then carried through. Not here. If I arrive intending to accomplish something that won't take long, three or four things happen straight out of the chute that need immediate attention. I'm constantly moving from one question or request to the next."

In the monochrome world of engineering management, Tasker gave instructions to contractors and was responsible for the final word on everything. Now, she has to adapt to solving human problems. Many employees stay with the city 20 to 30 years, and Tasker finds saying no to them difficult. "My goal is to make sound decisions for customers and staff," she says. "By explaining a situation's pros and cons and the reasoning behind my decision, they usually understand."

"I never thought about being a pioneer for women in the utilities engineering field. I'm just passionate about my job and doing it to the best of my ability."

Martha Tasker

Another management method Tasker finds helpful is to task employees to explain why their requests or suggestions make sense to everyone — not just within their department — and why they should be adopted. "Once they do the legwork, they discover that coordinating between the different work groups isn't as easy as it appears," she says.

Moving ahead

Tasker enjoys helping citizens and wants to be the first person staffers talk to when things go wrong, but she is also her team members' advocate. Her progression plan has accelerated their advancement.

Until 2016, operators couldn't progress until someone above them left or was promoted. Tasker's plan, approved by city officials, allows new hires to advance from operator I to operator II by fulfilling certain requirements. One prerequisite is certification through the state Department of Health and Environment. Another is developing

(continued)

Salina Water Distribution and Waste Water Collection team includes Lori Sullivan, Ray Starnes, Glenn Questeo, Director Martha Tasker, Wayne Juenemann, Mark Peterson, Christina Sidebottom, Tye Baker and Larry Charles.

improvement plans for any phase of the Utilities Department.

"The next step up is senior utility operator, a new position created to groom people for supervisor positions," says Tasker. "People determine how far they wish to advance, and some are aggressive. It's exciting to see their interest because they represent future operator replacements." About 25 percent of employees are engaged in the plan.

Quick results are the exception. Tasker's projects usually take five or 10 years to reach fruition, and many focus on ensuring the future availability of water for the community. The wake-up call came in 2006 when the Smoky Hill River ran dry during a drought. Tasker pushed to develop a 50-year raw water supply study, and Phase One launched in 2008.

"Originally, our water rate was the more you used, the less it cost," says Tasker. "We pumped 5 mgd in winter and 13 to 14 mgd in summer." The city's new rate is based on water conservation practices used by semiarid communities west of Salina. It doubles the cost of water when usage exceeds 120 percent of normal winter volume. The study also revealed that 15 percent of customers caused peak demand by irrigating their yards. The new rates dropped usage to 10 mgd in summer.

Greening the fields

Simultaneously, Tasker addressed the plight of farmers downstream from the Kanopolis Reservoir. Because the state purchases water storage in the lake, legislation limits its availability to municipal and industrial users. The drought brought to light the importance of stored water to downstream users. "Agriculture is our predominant economic activity, and irrigation accounts for 84 percent of raw water usage," she says. "The survival of those farmers was at stake."

Tasker spent five years working with the Kansas Water Office and partnering with farmers in the river basin to remedy the situation. In 2011, legislation created the Lower Smoky Hill Water Supply Access District. It enables more efficient management of water resources for downstream users, while helping the city meet water demands during droughts. "We do a lot of good things pertaining to water, and we're feeling pretty good about it," says Tasker.

Improving water quality was another project that made people happy. "When I first arrived, we had numerous complaints about bad-tasting, smelly water," says Tasker. "Out of 330 miles of distribution pipes, 275 miles were old cast iron lines." A study convinced city officials to begin a water main replacement program that included upsizing pipes to improve fire protection.

Another water-quality effort involves removing trichloroethylene, an industrial solvent, contaminating groundwater on the former air base. Tasker is overseeing a five-year, $10-million-dollar study of the potable wells. "The project is a little out of my bailiwick, but incredibly interesting," she says. "I think we'll finish sometime in 2017, know the corrective action, and begin remediation."

Building for the future

Tasker moved into Phase Two of the 50-year raw water supply study in 2010. One project addressed how to provide water for the community if a natural disaster disabled the only treatment plant. An engineering study and countless meetings finally produced results.

MAKING THE BEST OF THE SITUATION

An invitation to take part in the first Science on Screen film and discussion series at the Salina Art Center intrigued Martha Tasker. As utilities director, she constantly sought to involve women in science, which is the objective of the series.

Her partner, Verna Fitzsimmons, was CEO and dean of the Kansas State University Polytechnic campus. The two had worked together on groundwater contamination projects. "The film was about dysfunctional people and had little to do with science," says Tasker. "As we left the screening, we wondered what we were going to say."

"We do just as much as the police or firemen to protect our community and the environment, except our work isn't recognized by the media. The award shined a spotlight on our industry and maybe helped students see how much science, math and engineering are involved."

Martha Tasker

In April 2017, the city selected a design-build team to improve the South Well Field and build either a 3.5 mgd membrane filtration plant or a lime-softening plant. "Industries would love the membrane treatment, and building the plant could attract new companies to town," says Tasker. "We'll also be able to support significant growth."

By the time the build is completed in 2020, Tasker will be designing an upgrade for the wastewater treatment plant to meet new nutrient removal standards. She designed a major plant upgrade in the late 1980s and a belt filter press upgrade in the early 1990s. Whether designing for water or wastewater treatment, Tasker is in constant touch with end users. "I learned firsthand while at Wilson & Company that bringing operators into the design process produces a superior product," she says. "They know every good and bad thing about their plant."

Pleasant surprise

With numerous projects on her plate, Tasker said nothing to family and friends when notified of her 2016 Women of Achievement award. It wasn't until a newspaper article broke the story and strangers extended congratulations that the tumblers clicked into place. "We do just as much as the police or firemen to protect our community and the environment, except our work isn't recognized by the media," she says. "The award shined a spotlight on our industry and maybe helped students see how much science, math and engineering are involved."

Tasker actively encourages young women to explore careers like hers. She speaks to high school classes and is a regular presenter at the annual Teen Women in Science and Technology workshop developed by the community and the Kansas State University Polytechnic campus.

The event, aimed at young women, failed to attract them. "We looked for bright, young, smiling faces in the room and couldn't find any," says Tasker. "There were two or three science teachers and 20 to 30 people who probably wanted to hear what we had to say."

A different audience demanded a different approach. Instead of their planned discussion about their careers and the opportunities science affords women, Tasker and Fitzsimmons asked how the community could retain its bright students and bring back those who had left. "We heard many interesting comments and had lively discussions," Tasker says. "It made for a great event, and everybody took away something positive."

Meanwhile, Tasker intends to finish all the projects she has worked years to put in place before retiring. "When I leave, I want to hand over a utility that meets current standards, meets future demands, and needs maintenance instead of repair," she says. "That will be my legacy." ✦

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GET YOUR PEOPLE UP TO SPEED

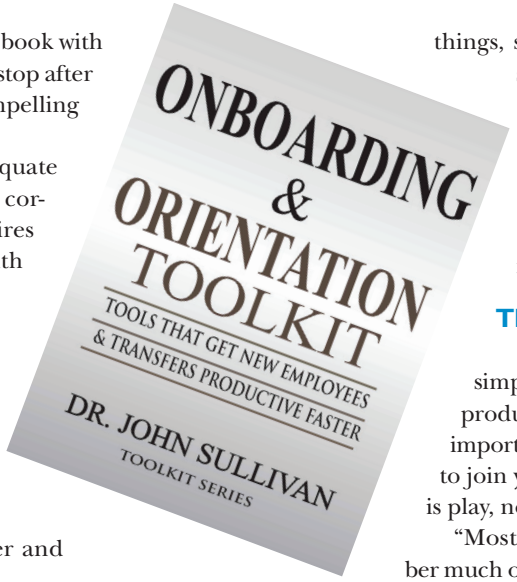
Instead of dousing new employees' excitement with ineffective onboarding, use data-driven techniques that boost retention rates

By Ken Wysocky

We invite readers to offer ideas for this regular column, designed to help municipal and utility managers deal with day-to-day people issues like motivation, team building, recognition and interpersonal relationships. Feel free to share your secrets for building and maintaining a cohesive, productive team. Or ask a question about a specific issue on which you would like advice. Call editor Luke Laggis at 800/257-7222, or email editor@mswmag.com.

Have you ever started to read a much-hyped book with great enthusiasm and anticipation, only to stop after a few chapters because it just wasn't compelling enough to keep on going?

At many companies and organizations, inadequate and mind-numbing onboarding programs are the corporate equivalent of that dull book, leaving new hires dispirited and wondering why they should stick with their new employer.



The cure? A data-driven onboarding program that sustains — not stifles — new hires' enthusiasm. That, in turn, reduces new employee turnover and boosts their productivity. It also improves your organization's brand, which makes it easier to recruit top talent, says Dr. John Sullivan, a professor of management at San Francisco State University in San Francisco as well as an author, speaker and business consultant.

"Most onboarding programs are not well designed because they're not data-driven," says Sullivan, who wrote *The Onboarding & Orientation Toolkit: Tools That Get New Employees and Transfers Productive Faster.* As a consultant, he's also helped dozens of companies — including some utilities — develop effective onboarding programs. "They just do things that people like or that they remember they did during their own orientations, but they aren't necessarily effective. So people come in excited about their new job, and what they get is death-by-form — read this manual, fill out this form. By the end of that first day, all their excitement is gone."

Keeping new hires enthused and engaged is no small matter. Studies show that about one-third of new employees quit their jobs within the first six months of employment. And considering the expense of high employee turnover, coupled with a shrinking labor pool as overall employment rises and a coming wave of baby boomer retirements (especially at water and sewer utilities), it's easy to determine that effective onboarding is more important than ever.

Moreover, good word-of-mouth reviews of a company can help immeasurably in future recruiting efforts. "When we start a new job, they're invariably asked what it's like," Sullivan notes. "So if you treat people right, it helps your company's brand image and probably gets you more recruits. It's a longer-term benefit of strategic onboarding, as opposed to tactical things, such as making sure employees get their building security passcard or read an employee handbook."

Furthermore, poor onboarding raises other risks. It puts new hires in a position to unknowingly damage customer relations or raise the ire of colleagues who believe they're carrying too much of the load when new hires don't get up to speed fast enough, he says.

The goal is productivity

The main priority of any onboarding program is simple: Put employees in a position to maximize their production as quickly as possible. "Learning the rules is important, too," Sullivan says. "But if you hired Tiger Woods to join your golf team, the first thing you'd want him to do is play, not hold off for a few days and attend meetings.

"Most people are too stressed and too nervous to remember much of what they're told during those first few days anyway, and much of it has no value," he continues. "So, it's very important to first figure out what they really need to know."

The second most important goal is employee retention. That can be achieved by doing things such as holding "get-to-know-you" events that hasten the networking process; showing them possible career paths within the organization; scheduling regular feedback meetings with their manager; clearly spelling out goals and expectations; providing them with answers to frequently asked questions, developed by surveying previous new hires; and assigning new employees a "peer buddy," someone who's relatively new to the company and that new hires would feel comfortable asking the proverbial "stupid" questions, like the location of bathrooms.

"You don't want employees to focus for six months on apples, only to find out that oranges were more important," he notes. In addition, a new hire's manager should be present on the first day and consistently offer them attention, encouragement and training. "The manager should own the onboarding process," Sullivan says.

Onboarding is a long-term process as opposed to orientation, which might last a day or so. A good onboarding program will last for months. That's not to say it should be nonstop: after the first week or so, perhaps three to five touch base hours a week will suffice.

Sullivan also recommends preonboarding as a way to improve employee retention. In the wastewater industry, for instance, that might involve ask-

(continued)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• Turnkey service options available • Detect overflow conditions early
• System-wide performance at a glance • Optimize sewer cleaning
Sewer Overflow
PROBLEMS SOLVED
in... weftec the water quality event
BOOTH 831
ADS
www.adsenv.com/echo

"Most people are too stressed and too nervous to remember much of what they're told during those first few days anyway, and much of it has no value. So, it's very important to first figure out what they really need to know."

Dr. John Sullivan

ing job applicants to spend a day cleaning a sewer. Most applicants say they won't feel claustrophobic and can stand the smell and the waste, but in reality, many cannot. "They say they can do it because they want to appear tough, but many can't do it," he says, noting his experience as a consultant for a sewage treatment plant where new employees frequently quit after one week of work. Preonboarding helped solve the problem.

Make It Data-Driven

In the end, onboarding programs should be systematically evaluated by examining data. For example, quiz managers about why certain employees become more productive faster and use the findings to establish onboarding protocols. Also, ask new hires what worked best during onboarding — and what didn't work, too.

"The key questions are why they could produce earlier and why they couldn't produce earlier," Sullivan notes. "It's critical to ask managers if they see things that helped get someone up to speed faster. Good data comes from real people. If you hire a pitcher and figure he'll lose games for the first nine months, that's not good. But if I told you that the pitcher could start winning in one month, you'd listen to find out why, right?"

Good onboarding programs don't have to be expensive, either. And even if they are, Sullivan points out that it's even more expensive not to have a good onboarding program.

Extreme onboarding — epitomized by high-tech companies like Google — is trendy these days. From weeklong scavenger hunts aimed at networking and learning company culture to participating in silly skits and contests or playing specially developed onboarding video games, industry leaders are making the process more of a celebration than a boring administrative task. Sullivan is a big fan of Google's process, which reportedly gets employees up to speed 25 percent faster. And those who think that what Google does can't possibly apply to conservative industries like sewer and water utilities, do so at their own peril, Sullivan emphasizes.

"Google is one of the most valuable companies in the world, so I would copy them even if I were a janitor," he asserts. "If you want to perform like the best, you have to act like the best. I've worked with utilities before and on the people side, they're generally not data-driven.

"We've used the Google onboarding model for 7-Eleven stores," he points out. "I recommend the Google approach because any manager can do it. No offense, but utilities rank at the bottom in terms of people-management capabilities. So why not follow Google's lead? They're really smart and have the (onboarding) data to back up what they do."

The bottom line is that ill-conceived onboarding can be as dull as going to homeroom every day in high school. "No one looks forward to that," Sullivan says. So instead, make onboarding a memorable event. Try holding a strategic, weeklong scavenger hunt, for example. Or do something as simple as taking new employees out for a beer. Then ask probing questions to find out if they're producing the desired results. As Sullivan says, "Whatever the data says, do it." ✦

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FRESHWATER FRONTIER

North America's northernmost metropolitan water utility conquers the challenges of delivering high-quality water and great service

By Jim Force

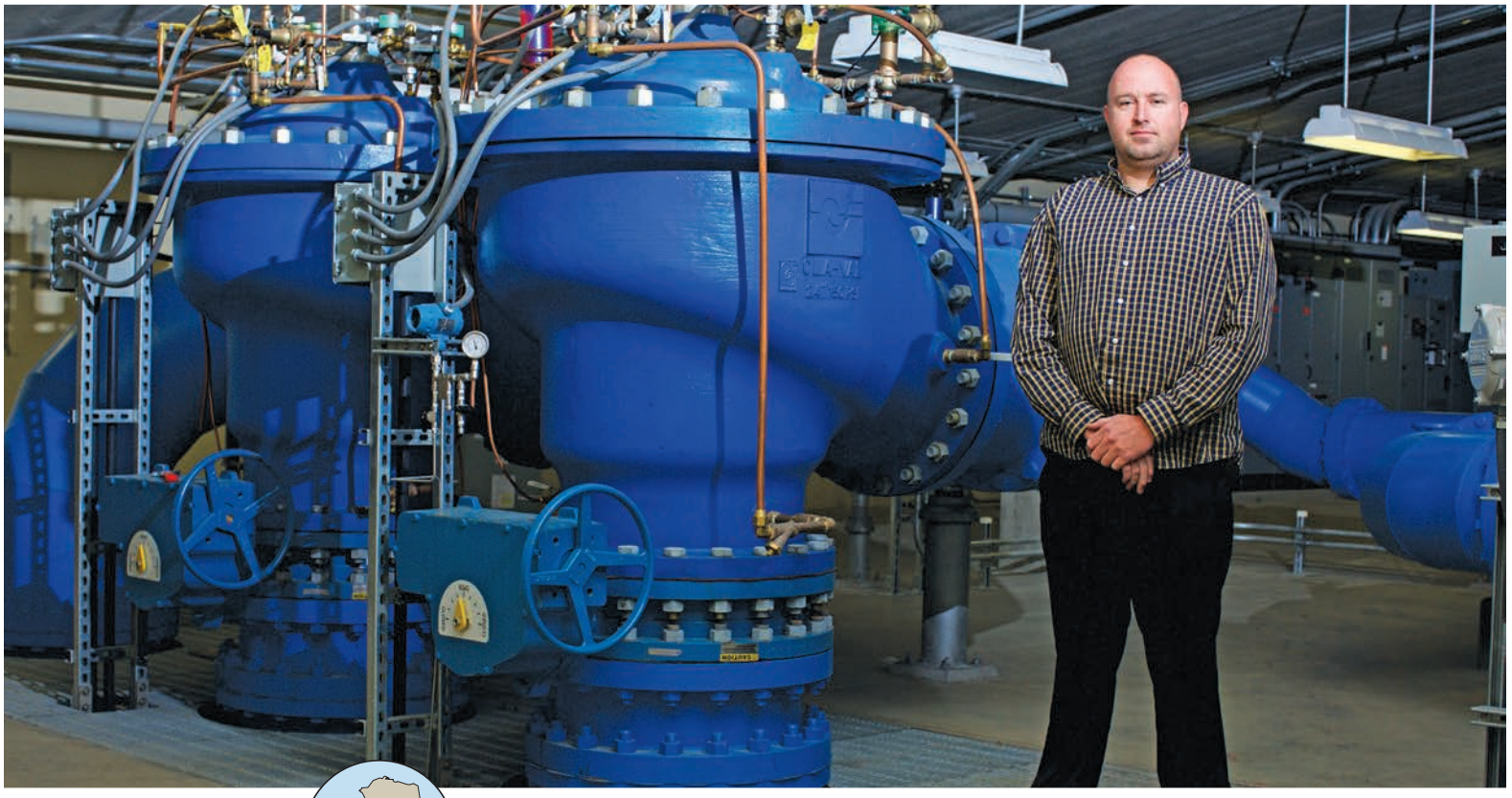
When the residents of Anchorage, Alaska, turn on their faucets, it's a good bet that they have little understanding of the challenges the Anchorage Water and Wastewater Utility must overcome to supply them with clean, clear water.

"It's the most complicated water system in the world," says Joe Polowy, AWWU distribution operations supervisor.

That's not an overstatement: the majority of the source water is drawn from Eklutna Lake, some 20 miles from the city proper; the piping must be buried at least 10 feet deep to avoid freezing; and the water passes through heat exchangers at the local power plant to warm it up to 59 degrees F (see sidebar).

The pressure zones in the system are the most critical factor, however. "We have some customers at

Glacier-fed Eklutna Lake supplies Anchorage with over 90 percent of its freshwater supply. It is the last glacier-fed water system in the country. (Photography by Brian Adams)



Treatment plant operator Guy Miller stands next to a Cla-Val valve in one of Anchorage's pump stations. The city's distribution system includes 70 separate pressure zones.

PROFILE:
Anchorage, Alaska, Water and Wastewater Utility

FOUNDED:
1921, when the system was purchased from the local railroad company

AREA SERVED:
Anchorage, Chugiak-Eagle River, Peters Creek, Eklutna and Girdwood

POPULATION SERVED:
Over 263,000 people
(52,000 customer accounts)

PRODUCTION:
An average of 25 to 35 mgd
(average peak demand of 55 mgd)

SOURCE WATER:
Eklutna Lake (glacial runoff), plus several groundwater wells

TREATMENT PLANTS:
Eklutna Lake, Ship Creek, Girdwood

WATER MAINS:
800 miles

ANNUAL OPERATING BUDGET:
$50 million

STAFF:
260 (water and wastewater)

WEBSITE:
www.awwu.biz

sea level and then other customers just a few miles away at 1,200 feet above sea level," says Polowy. The system is comprised of 70 pressure zones and 500 pressure-regulating valves. "Managing, boosting and regulating pressure is a big job for us."

In fact, Anchorage conducts a comprehensive PRV training program and maintains one of the few live PRV training facilities in the world.

Glacier-fed

The AWWU serves a greater Anchorage population of 263,000 through 52,000 customer accounts. Average daily demand is 23 mgd, and average peak daily demand is 55 mgd. Storage capacity is 65 million gallons.

Raw water — glacial runoff, rain and snow from the Chugach Mountains high above the city — is drawn from the 8-mile-long Eklutna Lake and piped via a tunnel through canyons to one of two water treatment plants. It's the last glacier-fed source in the country, and the utility's website calls it a "pollution-free source that will last well into the 21st century."

The majority of the flow is treated at the 35 mgd capacity Eklutna Lake plant (Brian Yonkoske, superintendent), which has been operational since 1988. The 24 mgd Ship Creek plant (Polowy, superintendent) is used as a backup, though it is kept in a constant state of readiness. In 2014, when the Eklutna Lake plant was shut down, all of the flow was processed through the Ship Creek plant, which dates back to 1962. In addition, the utility's distribution staff is headquartered there. A smaller, 500,000 gpd plant serves the community of Girdwood at the far southern end of the system. Gene Biever is superintendent there.

Treatment at both the Eklutna Lake and Ship Creek plants consists of coagulation with poly-aluminum chloride, mixing, sedimentation and multimedia filtration. Sodium hypochlorite — generated on-site — is used for disinfection, and the finished water is fluoridated.

The utility also maintains several groundwater wells that can supplement the drinking water supply.

The distribution system is mostly gravity-flow and consists of 800 miles of pipe, primarily cast iron, ductile iron and PVC. The utility maintains 7,000 hydrants.

Polowy explains that the distribution team is responsible for more than 200 water distribution facilities, including well sites, PRVs, boosters, vaults and reservoirs. "If we have to lay pipe in lengths greater than 1,200 feet, we contract that work out," he says.

(continued)

"We have some customers at sea level and then other customers just a few miles away at 1,200 feet above sea level. Managing, boosting and regulating pressure is a big job for us."

Joe Polowy

Thorough training

Despite this multitude of tasks, Polowy's staff remains focused on the PRVs. "Maintaining them is an art form," he says.

The utility offers a rigorous program of training on the valves, with a two-day course on their operation and maintenance that's offered to operators and engineers. Operators from the distribution operations group are identified for a more advanced course that lasts six weeks.

All told, Polowy says it takes five to seven years of training and experience for an operator to become fully qualified and certified. "Of our existing staff, about one-third are at the advanced level, one-third at intermediate, and one-third at the beginning level," he says. "It takes a long time and lots of hands-on experience."

While AWWU operators get plenty of that in the field, they can also train in one of the few live classrooms in the industry. "We have PRVs in the training facility, so operators can learn in a no-fear atmosphere," he says.

It's not a simple matter of on and off. Polowy explains that Anchorage is not just trying to reduce high pressure as the water travels down to the main population areas; but rather, the system is configured to sustain certain pressure levels in certain pressure zones. The system even has PRVs in all three of its water treatment facilities. "We need to sense high-pressure events in order to prevent breaks or ruptures in our customers' lines," he says.

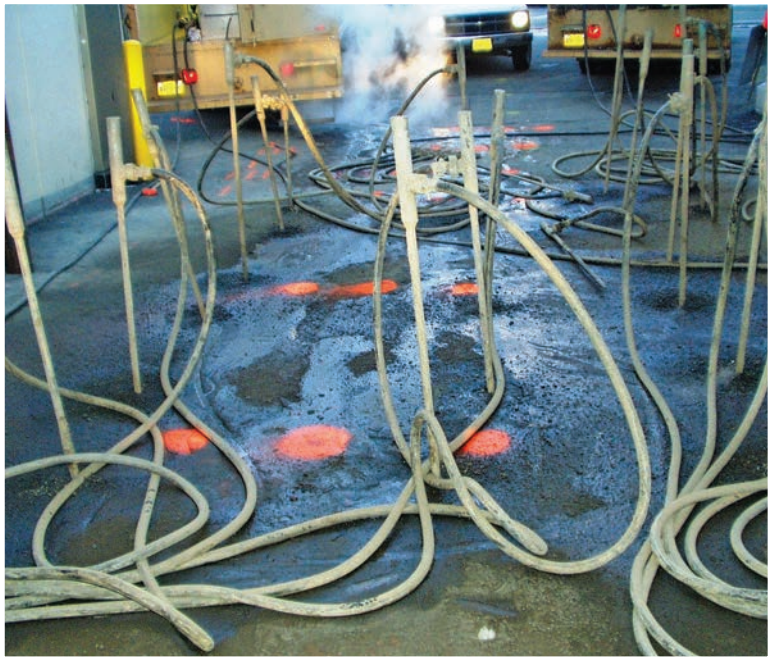
Leak location

Rob Rose is AWWU's system maintenance foreman in charge of the utility's leak detection program.

"Each year, we have a contractor assess segments of water main to determine condition of pipe and the likelihood of failure," he says. This year, the utility plans to analyze some 20,000 feet of pipe and another 10,000 feet if funds are available.

Rose says that the evaluation process often turns up existing leaks that call for repair. "We go out and verify we have an active leak by listening on valves in the area, using an LC-2500 Leak Correlator (SubSurface Locators)," he says. "The operator puts in certain information like pipe length, pipe type, and size, and then turns the repair over to our excavation crew. We also get reports of leaks from crews who are out working on hydrants or valves."

(continued)



PHOTOS PROVIDED BY THE CITY OF ANCHORAGE

Above: A steam set thaws the ground so work on a water main can begin.

Right: Utility workers use a Vactor 2100 to excavate a water main. Lines are buried deep to avoid freezing.

TEMPERATURE TRADING

You could call it temperature trading. Through a longstanding cooperative agreement between the Anchorage Water and Wastewater Utility and Municipal Light & Power, the two organizations are realizing numerous mutual benefits.

About 19 mgd of treated water from the AWWU's Eklutna Lake plant passes through heat exchangers adjacent to ML&P's Plant 2A, located at the utility's Ship Creek campus. The exchange heats the drinking water from approximately 44 degrees F to 60 degrees F to prevent freezing in system piping during the winter months.

At the same time, the process cools water for the cooling towers at the ML&P Plant 2A, and much of the thermal energy contained in the waste heat from the power operation is captured — as opposed to being exhausted to the atmosphere. The thermal efficiency of the power plant is improved dramatically, and air pollution is reduced.

"Heating water for residential and commercial use is very energy intensive," explains Todd Carroll, AWWU engineer. "And exhausting waste heat from power generation facilities into the atmosphere contributes to air pollution and power plant efficiency loss.

"By capturing waste heat from the power generation process, AWWU helps prevent water distribution and service pipe freezing and helps optimize power plant efficiency while also lowering the energy used by AWWU customers to heat their potable water." Reduced water consumption and wastewater production at the power plant is yet another benefit.

Carroll also reports that this cooperative effort — which has been in existence for years — is improved through the development of ML&P Plant 2A. In the past, ML&P Plant 2 was only able to heat a portion of the potable water headed into Anchorage from AWWU. The new facility contains new double-wall plate heat exchangers from Sondex (Danfoss Water and Wastewater), which improves the process such that more of AWWU's distribution system can receive the heated water. "In the old system the bulk of the heated water could only be distributed to a portion of AWWU's water distribution system due to pipe configuration. The construction of the new heat exchanger will include piping upgrades to allow heated water to be distributed to a wider area of AWWU's distribution system."

Carroll notes that the project is unique in its scale for potable water waste heat recovery and would not be possible without a large municipal water pipeline with low water temperature adjacent to a power plant.

PHOTOS PROVIDED BY THE CITY OF ANCHORAGE

An AWWU crew works on a line replacement project. The utility's 2012 master plan identified more than $52 million in water system rehabilitation, repair and replacement projects.

Crew members clean a line.

He adds that water surfacing frequently indicates leaks, but because of factors like the depth of the pipe or frost in the winter, the leak is not always near the location of the surfacing water. "Again, we will use our SubSurface leak correlation equipment to locate the leak to minimize the area of an excavation."

Polowy points out that new and better materials like epoxy coatings and stainless steel lines have helped the utility reduce leaks and breaks. He also credits the utility's engineering staff, corrosion expertise and planning, and robust pipe replacement program.

Pipeline projects

To continue to provide high-quality water in the future, the AWWU developed a master plan in 2012, identifying and justifying more than $52 million in water projects, including rehabilitation, repair and replacement of waterlines.

The Railroad Yard pipeline replacement project, which just wrapped up, presented a unique set of challenges.

"It was one of the most complex pipeline projects I've encountered," says AWWU project manager James Armstrong about the replacement of roughly half the waterlines serving the Alaska Railroad Corp.'s rail yard, located in the Cook Inlet drainage area.

"We have PRVs in the training facility, so operators can learn in a no-fear atmosphere."

Joe Polowy

The old lines dated to the 1940s and consisted of unlined cast iron with considerable interior corrosion. Leaks had become a serious problem, especially a 2009 incident that resulted in abandonment of some of the lines and interruptions in hydraulic connectivity that reduced fire flow. Plus, stagnant water in dead ends was creating water-quality issues. In some cases, the damaged lines were too close to railroad tracks to allow repair without disrupting railway operations.

The replacement project involved approximately 6,000 linear feet of old lines and was divided into two phases: north and south. Armstrong explains that in the north section, open cut trenching and replacement of the old 4-

through 10-inch-diameter lines with PVC was the choice. CIPP was specified for the south section's 10-, 12- and 16-inch pipe. Frawner Corporation of Anchorage was the contractor on both phases.

"The north phase was bid and awarded in spring 2016. The contractor immediately proposed a value engineering change to use horizontal directional drilling to install the majority of the pipe," reports Armstrong. He estimates the HDD approach saved about 5 percent of the overall project cost. HDD generated less unusable contaminated soil, produced fewer dewatering discharges, simplified working around other utilities, and avoided remnant building structures.

While the north phase was completed in late 2016, the south phase was just recently finished. "We chose CIPP due to the potential cost of relocating pipes away from tracks and structures," says Armstrong. "The work occurred within a few feet of the tracks and inside buildings. We could not have done the work as effectively without using CIPP lining."

Anchorage prepared thoroughly for the line replacements, using a camera system to determine the condition of existing pipes. The utility was just as careful throughout the course of the project because American Railroad Engineering and Maintenance-of-Way Association standards had to be met and there were numerous geotechnical and environmental issues that had to be addressed.

The weather and the Alaskan tourist season also came into play. Armstrong explains that the rail yard supports tourist trains and cruises from May through September, meaning the pipeline rehabilitation had to be conducted during the colder months. "Temperatures for October through April average near or well-below freezing here," he says. "Temporary waterlines and replacement soil on the surface had to be heated and covered during the project."

Challenges overcome

Temperature, terrain, tourism, and training were all part of the unique challenges facing the largest water utility in Alaska and the northernmost metropolitan water utility in all of North America. But the AWWU has overcome these obstacles and more. In fact, over the years, they've racked up awards for best-tasting water and for fluoridation. Their self-imposed turbidity limits of .01 NTU easily beat the requirements.

But that wouldn't mean a thing without customer satisfaction. Polowy sums it up: "We want to make sure everyone is getting good pressure to their homes and for fire protection, and that the best quality water is reaching our customers."

People are the key, he says. "They put all of themselves into their work and take full responsibility for water quality and fire protection throughout the district. They are our strongest asset." ✦

"We chose CIPP due to the potential cost of relocating pipes away from tracks and structures. The work occurred within a few feet of the tracks and inside buildings. We could not have done the work as effectively without using CIPP lining."

James Armstrong

MAKE THE MOST OF YOUR CCTV DATA

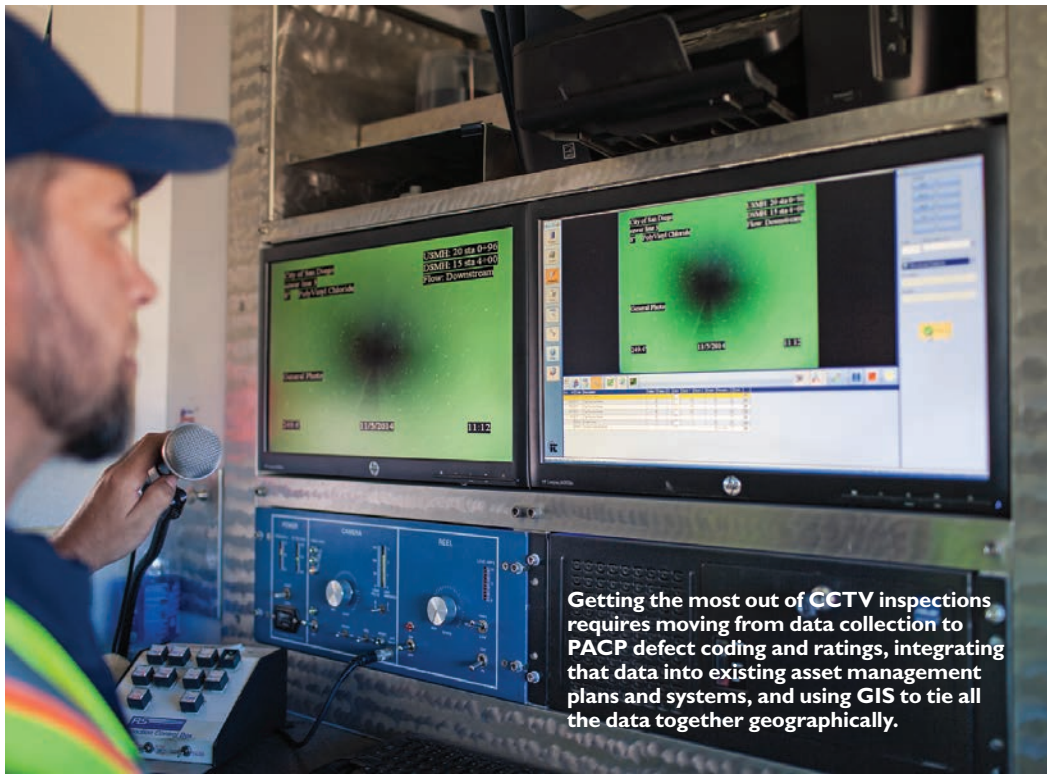
A comprehensive understanding of the entire process will help your utility get the most bang for its buck

By Matt Timberlake

One of the challenges with an asset inspection program is taking the data collected in the field and making it easily usable across all levels of your organization.

Making CCTV field data easily usable can be a challenge regardless of whether you are a small utility with no information technology staff or a large utility with dedicated staff that oversees an asset management program, GIS, and other systems. Management, operations, engineering and consultants all want different information in different ways.

For most of my career, I have seen a focus on data collection. Many utilities have done a great job performing CCTV inspections, whether the work is contracted out or handled in-house. Most utilities are now using NASSCO's Pipeline Assessment and Certification Program (PACP) universally to collect and rate the data in the field, which has been a tremendous step forward for the industry. But I am now seeing a strong desire to do more than just collect data: there's a desire to integrate the data into other systems across multiple levels of the utility and make it highly usable. This is how I feel a utility can get the most bang for its buck.



Getting the most out of CCTV inspections requires moving from data collection to PACP defect coding and ratings, integrating that data into existing asset management plans and systems, and using GIS to tie all the data together geographically.

The PACP was designed with a high-level utility management plan in mind, but also with a simplicity that makes it usable and realistic. PACP collects "defects" into two categories — structural and O&M — which allows defect reporting to look at things individually or collectively. This data is used to generate a pipe segment's likelihood of failure (LoF).

Fast forward to my point: One of the things we at Ted Berry Company have seen is the need for a comprehensive understanding of the entire process — from data collection in the field to PACP defect coding, PACP ratings like the overall quick rating and calculating total LoF, as well as the complexities of integrating that data into existing asset management plans and systems (like CityWorks, Hansen, Maximo and others), and using GIS to tie all the data together geographically.

This is how we at Ted Berry Company help utilities accomplish this:

- We have six dedicated mainline CCTV trucks in New England, all with NASSCO PACP operators collecting data and coding defects. Our mainline trucks are equipped with transporters to get our cameras where they need to be and include robots, boats, skids, and about everything in between to inspect 4- to 120-plus-inch pipe. We also have dedicated mainline lateral launch systems that allow us to provide comprehensive lateral inspection programs for I&I, prepaving projects, and preconstruction damage prevention programs (especially for natural gas work).
- We have a full-time technical services department that performs QA/QC review of CCTV data as well as daily, weekly and monthly report-

ing for individual projects. Reports often include customized reports requested by the utility. One utility recently asked, "We have a chemical root control program and have Duke's coming to do root treatment. Can you provide us a 'root report' for all the lines inspected in 2015-16?" An hour later we provided them with a customized root report showing only root defects, the pipe segments I.D., pipe type, pipe size, street location, and GIS points that they could deliver to their contractor.

- Our technical services department performs data integration by taking the PACP database and integrating it into whatever system that utility uses. (Like GIS or CityWorks.)
- We can code older CCTV data that was not done in PACP but that may exist on VHS, DVD or another medium and set up an initial asset database. We call this data conversion, and I have always been under the belief that if you have data, it should be usable.
- We have the ability to map small systems using GIS and Trimble technology as well as link data across platforms.
- We are able to perform a comprehensive risk analysis and mathematical grading of individual assets using our proprietary risk tool. This helps us develop the CoF (consequence of failure) and, by using the LoF from the PACP database, generate a total asset risk.

I love what I do and enjoy helping utilities large and small move their asset management program forward. If you would have told me when I was a kid that I would get to play with robots, inspect pipes, own all kinds of cool trucks, and work with the amazing people I do, I never would have believed you. ✦

About the Author

Matt Timberlake is president of Ted Berry Company in Livermore, Maine.

DON'T LET A BLIND SPOT KILL YOU

Roadside workers need to pay full attention to the hazards of the job

By Julie Steding

You don't have to be in a car to get killed in a car accident.

Struck-by, struck-against and back-over incidents are far too common:

• Woods Hole Golf Club, Falmouth, Massachusetts, April 21, 2016: Construction worker injured in back-over accident.

• Interstate 440-East, Raleigh, North Carolina, April 19, 2016: DOT workers seriously injured when motorist crashed into highway maintenance truck.

They can happen any place and at any time, which is why they are so difficult to prevent. Contributing factors to struck-by incidents include:

- **Poor visibility** when working at night or in inclement weather.
- **Untrained workers** using tools improperly, wearing the wrong (or no) PPE, or engaging in horseplay.
- **Fatigue** distracting workers or motorists in a dangerous work zone.

Many believe that these incidents are actually "accidents," resulting from a series of unfortunate events. OSHA doesn't see it that way. According to OSHA, labeling struck-by events as accidents suggests a lack of control. Because you don't have the luxury of disagreeing with OSHA on semantics, approaching struck-by events as preventable incidents will result in more positive outcomes for your utility.

With that in mind, preventing struck-by, struck-against and back-over incidents comes down to optimizing situational awareness and committing to a safety culture.

Worst-case scenario

How do you increase awareness for all of your employees? Plan for the worst-case scenario. Another way to look at it is, "expose all your blind spots." Examples include:

- Install backup cameras in all heavy equipment.
- Implement internal traffic control plans to coordinate vehicles flow, equipment, and workers in a work zone.
- Be vigilant about PPE and training; enforce those zero-tolerance policies.
- Protect hearing and ensure clear communication among all workers.
- Install proximity sensors on rolling equipment to warn workers that get too close.

This is by no means a complete list. You'll want to customize the measures you need to optimize situational awareness on your job site or in your work zone. The goal is to get clear visibility into all of your blind spots.

Can't afford to retrofit all of your older equipment with back-up cameras? Then make sure you compensate with specific communications strategies, traffic plans, alarms and training.

The only way to gain traction with your proactive safety plan is to go all-in on safety culture. Only when safety is as automatic as "measure twice, cut once" will you have total buy-in from all workers.

Safety culture

The only way to gain traction with your proactive safety plan is to go all-in on safety culture. Only when safety is as automatic as "measure twice, cut once" will you have total buy-in from all workers.

Without a safety culture, you're endangering your workers. It's that simple.

Being known for your safety culture does more than just limit exposure. There are financial ramifications, too. Struck-by incidents caused 8.4 percent of all construction fatalities in 2014, according to OSHA. Struck-by and struck-against injuries in all industries amounted to $7.16 billion in workers compensation costs, according to the 2016 Liberty Mutual Workplace Safety Index.

Murphy and Yhprum

The pessimist follows Murphy's law: If something can go wrong, it will. From a struck-by safety perspective, having a healthy respect for Murphy's law can motivate you to plan for the worst, but it doesn't mean you have to be a pessimist.

What it does mean is that you have to be proactive about and accountable to struck-by dangers through an ingrained safety culture. Then, you can work according to Yhprum's law: If something can go right, it will. ✦

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THRIVING IN ISOLATION

Prince Rupert, British Columbia, is tackling a water infrastructure deficit as part of its plan to become the next great port city

By Peter Kenter

Hans Seidemann, Prince Rupert's manager of community development and civic innovation, approaches the 100-year-old Woodworth Dam in an isolated forest preserve on Kaien Island. The city has recently secured grant funds to replace the dam, which holds back Woodworth Lake, the city's primary water source. (Photography by Lonnie Wishart)

> **"We want to realize Charles Hays' vision and expand our port to become a major link to Asia across the Pacific Ocean and to Europe through the trade corridor emerging through the Northern Sea Route."**
>
> **Richard Pucci**

PROFILE:
City of Prince Rupert Operations Department, Prince Rupert, British Columbia

YEAR ESTABLISHED:
1914

POPULATION SERVED:
13,000

CURRENT AREA SERVED:
32.86 square miles

DEPARTMENT STAFF:
About 19 full-time employees

CURRENT INFRASTRUCTURE:
Sewer — 53.4 miles;
water — 52.9 miles

ANNUAL OPERATING BUDGET:
Sewer — $1.935 million;
water — $2.281 million

ASSOCIATIONS:
BC Water & Waste Association, Environmental Operations Certification Program

WEBSITE:
www.princerupert.ca/cityservices/utilities

The city of Prince Rupert, on the northwest coast of British Columbia, has every natural advantage needed to become the next great port city on the Pacific Ocean. Rebuilding city infrastructure, including the replacement of a 100-year-old water transmission main and dam located in an isolated forest preserve, is an essential part of that transformation.

On the leading edge of the 20th century, Charles Melville Hays, American president of the Grand Trunk Railway, selected Prince Rupert to be the western terminal of an expansive railroad system. Hays perished on the Titanic, but his dream of building a port city rivaling that of Vancouver remains alive. The city of Prince Rupert Operations Department is doing its part to make sure that happens.

"We call the project Hays 2.0," says Director of Operations Richard Pucci, CET, AScT. "We want to realize Charles Hays' vision and expand our port to become a major link to Asia across the Pacific Ocean and to Europe through the trade corridor emerging through the Northern Sea Route."

An island city

The city was incorporated in 1910 on Kaien Island, according to a plan created by Boston landscape architects Brett & Hall. Featuring curvilinear streets and open spaces, the city has remained true to that vision.

(continued)

"The original construction was done by cable and rail car, with a steam engine placed at the top of the slope. After every fifth or sixth section they installed, they rolled one piece of pipe into the bush as a possible replacement. They knew how difficult it would be to get back after original construction."

Richard Pucci

Today, Prince Rupert's Operations Department manages water, sewer and roads in this city of 13,000 residents.

"In the early 1900s, water was provided for the city using a wooden dam structure on Mount Hays, here on the island," Pucci says. "But it was replaced in 1929 with a submarine line that pumped water under the harbor from Shawatlan Lake on the mainland. Today, our primary water source is gravity fed from Woodworth Lake through a submarine line to our reservoir."

The 1929 line eventually flooded and was replaced by two lines in 1967 and 1987. The Woodworth Dam was built on Woodworth Lake around World War I. The lake is an elevated body of water that once helped provide electric power to the community.

Both lakes are located in a nature conservancy on the mainland that is provincially protected, in part, to maintain water quality.

The transmission main from Woodworth Dam, also once part of the hydroelectric system, was acquired by the city in the 1980s as a new water supply that would take advantage of the gravity feed from the lake.

The transmission pipe is 1.4 miles of 50-inch-diameter, rolled steel, bell-and-spigot pipe. The pipe runs almost entirely above ground in an area that's so isolated crews must take boats or helicopters to the mainland to work there. In some locations, the pipe is strapped by cable to the mountainside.

Steam power

"The original construction was done by cable and rail car, with a steam engine placed at the top of the slope," Pucci says. "After every fifth or sixth section they installed, they rolled one piece of pipe into the bush as a possible replacement. They knew how difficult it would be to get back after original construction."

The builders' plan was a good one. A landslide in 2008 took out a long section of pipe and required the installation of three of the reserve pipe sections left behind.

"We had to build a road to where the slide was, dragged the pipes out, heated them, shaped them and put them into service," says Pucci. "We're grateful that the line was down for maintenance at the time because if it had been fully charged it, would have interrupted supply and caused catastrophic damage to the natural habitat. It would also have scoured part of that side slope, tainting our lower water source at Shawatlans."

The original construction methods used lead and oakum joints. Although the pipe is in good shape for its age, Operations crews have attended to an increasing number of leaks.

"You can see the water supply location from city hall," says Veronika Stewart, communications manager for the city of Prince Rupert. "But it takes a half day to get there by boat and truck to get to the dam. Inspecting the dam and pipe means walking its length or riding alongside it on an ATV."

Wind and rain can make inspection even more arduous. City workers on that assignment always carry radios and travel in pairs.

The new pipe will connect to 3 miles of pipe built in 1995 to take the potable water to the shoreline. The submarine lines run about 600 feet in length. While the 1987 submarine pipe is

(continued)

Engineering consultant David Shearer (left) and Manager of Community Development and Civic Innovation Hans Seidemann stand over the entrance of the submarine line that transports potable water through Fern Passage to the city.

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A crew prepares footings for the clear-span bridge over the major Shawatlan River tributary. The bridge is part of a new access road, under which a new HDPE transmission line will be laid.

still in good shape, the 1967 pipe is beginning to show signs of corrosion.

Three phases to renewal

"We're currently working on a three-phase approach to renew our water supply infrastructure," Pucci says. "First, we'll replace the original transmission line, followed by the dam and finally the underwater transmission line that brings potable water across the harbor."

The project has been a primary goal for Pucci and the utility since he assumed his role in 2015. It has been championed both by city council and Mayor Lee Brain. It's also part of the city's goal for sustainability and self-reliance by 2030 — the dam replacement could once again contribute hydroelectric power to the grid.

The city sought the support of residents by

THE ART OF SELF-RELIANCE

Prince Rupert, British Columbia, is a modern city that remains somewhat isolated from larger cities, such as Vancouver. As a result, the city has become very self-reliant and even offers telephone and internet services through a locally-owned company. That's also true of the Prince Rupert Operations Department, which wears many hats, including roads, water and sewers.

Much of the repair work for the utility is performed by in-house crews, including a pool of multitalented general laborers with a wide range of skills. For example, crews recently completed a repair on a large-diameter water main construction project inside the city without outside assistance.

Pipe is primarily made of ductile iron and cast iron with some concrete. Current pipe infrastructure ranges from a few inches to 36 inches in diameter. Most leaks are traceable to the oldest pipe and early construction methods. According to Richard Pucci, director of operations for the city of Prince Rupert, the usual culprits are settling, acidic soil and normal pipe wear. Again, the distance from supply lines helps determine the utility's approach to repair.

"When we replace a length of pipe, we tend to do like for like, so ductile iron is replaced with more ductile," Pucci says. "We keep a large stock of pipe on hand so that we won't experience delays that would be caused by ordering unusual pipe specifications from suppliers far away."

While the city has designed some pipe replacement projects, maintenance takes precedence. When a pipe leaks, crews tend to replace longer lengths of pipe, for example valve to valve, or manhole to manhole, slowly rejuvenating the system.

Typically, older muskeg and sand excavated from a trench is replaced with new gravel. Even here, the city has developed a system that stresses self-reliance.

"The city owns its own gravel quarry that we use to source our material," Pucci says. "We then use the excavation in the gravel quarry as a landfill site and use the material we've taken out of the trench as cover for the landfill. Being on an island, we're always looking for creative ways within the utility to sustain ourselves and give the public the best bang for its buck."

Hans Seidemann observes work on the footings for a new clear-span bridge.

producing a video designed to demonstrate the state of the aging infrastructure, which few of them will ever see.

The replacement of the aging steel supply line and construction of a bridge and access road is a $6.9-million-dollar project funded by federal and provincial Building Canada Fund grants covering two-thirds of the costs. The city is covering the remainder through its Prince Rupert Legacy fund, a wholly owned subsidiary of the city of Prince Rupert, funded through a lease option with a liquefied natural gas proponent on industrial lands owned by the city. The budget includes a 15 percent contingency, simply because the project is so remote.

The construction contract was awarded to remote building specialist Kledo Construction of Fort St. John, which worked along the small right-of-way for the pipe that is reserved for the city.

Kledo Construction owner Brent Doyle arranged to use a nearby lumber yard as a staging area for aggregate, fusible 42-inch HDPE pipe, and fusing equipment brought in by barge. All told, the project required in excess of 100 barge loads of material.

Roadway is essential

Construction of a permanent gravel access road is essential to allow contractors access to rebuild the Woodworth Dam. The HDPE pipe will be located underneath the road.

During the length of the project, the city reverted to its backup water source: Shawatlan Lake.

The dam replacement project is budgeted at $8.6 million. It's funded primarily by the federal and provincially managed Clean Water and Wastewater Fund with $1.5 million to be supplied by the Prince Rupert Legacy Fund.

"The new concrete dam will be approximately 8 feet taller than the original and will be built 100 feet downstream from the old dam," Pucci says. "Once its complete, we'll remove key parts of the old dam and let the upstream side of the new dam slowly recharge."

The city is currently applying for $6 million in government funding to replace the 1967 submarine transmission line, a project that could be scheduled as early as 2018.

"A reliable potable water system is not only essential to the community, but will also be essential to the growth of Prince Rupert as the port city it was planned to be," Pucci says. "We think Charles Hays would be proud." ✦

"You can see the water supply location from city hall. But it takes a half day to get there by boat and truck to get to the dam. Inspecting the dam and pipe means walking its length or riding alongside it on an ATV."

Veronika Stewart

NASSCO (National Association of Sewer Service Companies) is located at 2470 Longstone Lane, Suite M, Marriottsville, MD 21104; 410/442-7473; www.nassco.org

IT'S TIME TO GET CUSTOMERS ON YOUR SIDE

Outreach and education will go a long way when you need to increase user fees

By Ted DeBoda

President Trump's proposed 2018 EPA budget of $5.7 billion — down considerably from the original $8.3 billion — could result in significant impact to the wastewater industry.

The proposed budget includes cutting nearly 25 percent from the Office of Enforcement and Compliance Assurance, which is responsible for enforcement of the Clean Water Act. While it's highly unlikely the proposed cuts will become law, the political undercurrent sends a strong message that clean water enforcement actions such as consent orders and decrees may decline, negatively impacting the proactive assessment and maintenance of sewer systems.

As our industry faces new and ongoing challenges, including the accelerated aging of our infrastructure, inflation, and increases in both population numbers and density, now is the time to proactively look at alternative solutions to fund the maintenance of sewer systems, especially those solutions that are nonreliant on the federal government or other nongovernment environmental agency enforcement actions. One source of funding that is worth exploring to bridge the potential gap in the proposed EPA budget is user fees.

While encouraging end user buy-in and ownership via increased user fees is perhaps the most organic solution to a systemwide challenge, the hurdle in increasing fees to help maintain our systems is the general population's lack of education on the importance of properly maintaining wastewater systems. With the exception of homeowners who use septic systems, the majority of property owners more than likely have no idea where sewage goes when they flush the toilet, and they probably don't care. Therefore, providing justification and value to an increase in user fees can be a real challenge. Why in the world would they spend money on something they can't see? This is where we must come together to build awareness and, more importantly, identify and share the value of being part of the solution.

When the public thinks of infrastructure, roads and bridges easily come to mind. Awareness of the need to improve water and wastewater systems, however, is not even on the radar unless a tragedy such as the Flint water crisis in Michigan occurs. Even in those extreme cases, assessment and maintenance are put on the back burner to address emergency rehabilitation efforts. Since most SSOs are tied to issues resulting from lack of proper inspection, maintenance, and repair rather than capacity, awareness of the value of proactively maintaining sewer pipes among all stakeholders is critical.

For more than 40 years, NASSCO has assured the continued acceptance and growth of trenchless technologies. As we enter the next chapter of NASSCO's influence on the education of our industry, we realize that the acceptance and growth, which has up until now been focused on system owners, must also include the elected officials charged with making sure systems are adequately funded. At the same time, we must educate individual home and business owners who are responsible for the maintenance of laterals, a major contributing component of overall wastewater system health. They also need to understand the tools available to help lower-income customers pay for these services. Customer Assistance Programs are becoming more popular throughout the country.

Strong community outreach programs that emphasize that we are all part of the solution will build a case for increased user fees and encourage everyone to fully comprehend the responsibility we all share when it comes to water access and consumption.

Building this level of awareness among the general population about the value of properly maintained sewer systems will take time, but if we don't start looking at the possibility of increasing user fees now, then when? Our infrastructure and industry are only as strong as our weakest links, and the more we begin asking for a fair, forward-thinking price directly from our customers, the more we will strengthen our opportunities in the future to secure funding to keep our systems healthy and avoid disaster, regardless of the source. ✦

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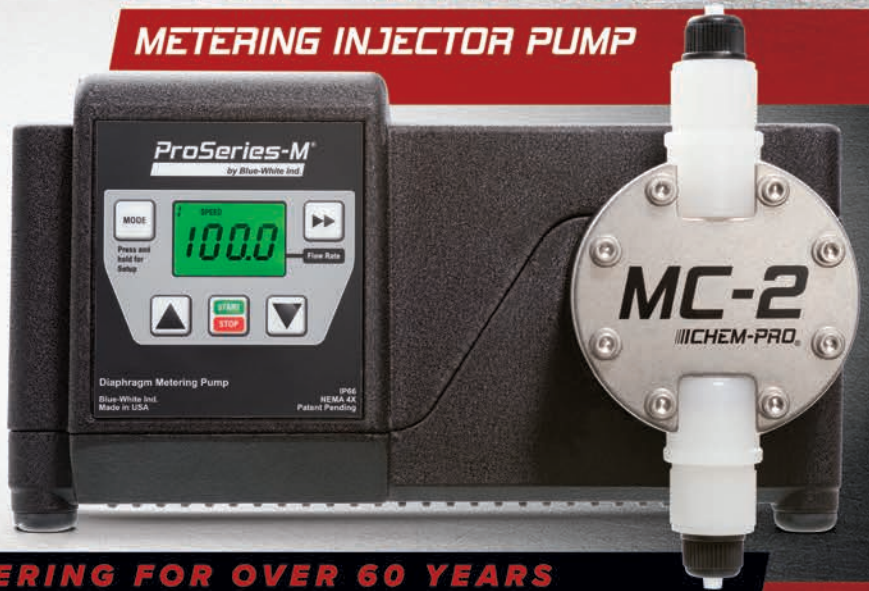

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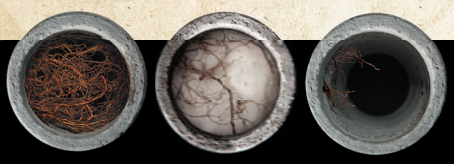

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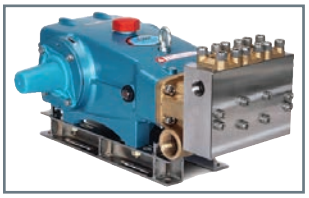
DIG THESE NEW PRODUCTS AT ICUEE 2017

By Craig Mandli

The International Construction and Utility Equipment Exposition (ICUEE), also known as "The Demo Expo," is the premier event for utility professionals and construction contractors to gain comprehensive insight into the latest technologies, innovations and trends affecting their industry. This year's event, slated for Oct. 3-5 in Louisville, Kentucky, promises to show off some of the finest new products on the construction market. Below is a preview of some of the newest products that will be highlighted at this year's show.

Cat Pumps Model 3560



The **Model 3560** from **Cat Pumps** is a high-pressure water pump with two performance ratings: 25 gpm at 3,000 psi or 20 gpm at 4,000 psi. It is ideal for equipment operating in high-duty cycle/remote applications, such as hydroexcavating and jetting. This pump can be direct-driven hydraulically or pulley driven from a motor or engine. V-packings and low-pressure seals are completely lubricated and cooled, increasing pump life. No external oilers are required. The wet-end is easily serviced without entering the crankcase. A 316SS discharge manifold is optimal for hydroexcavating and other high-duty cycle applications. **763/780-5440; www.catpumps.com; Booth 2129.**

Ditch Witch JT40

The **JT40** and JT40 All Terrain horizontal directional drills from **Ditch Witch** use advanced drilling-system technology to conquer tough drilling environments. Show attendees can test the HDD virtual-reality training simulator, a component of the Ditch Witch HDD Certified Training program. The technology allows users to simulate a real HDD job site via its two-screen display and joystick. The VR simulator accelerates training for new-generation HDD operators without compromising job site safety. Attendees can explore the latest HDD tooling options for drilling in hard rock environments, including the Rock Monster backreamer and All Terrain drill pipe and housing. **800/654-6481; www.ditchwitch.com; Booth K155.**

HammerHead Trenchless Equipment HydroGuide HG2200

The 22-ton radio-remote controlled **HydroGuide HG2200** downhole winch from **HammerHead Trenchless Equipment** is designed for maximum efficiency and ease-of-use in pipe bursting, sliplining or slitting applications. It takes minutes to set up or tear down. Radio-remote control enhances ease-of-use, productivity and safety. Operators can fine-tune depth to 20 feet with the precision controls. Line payout speed is adjustable from 0 to 100 feet per minute, and pulling speed is 0 to 60 feet per minute. Line pressure is adjustable from 0.5 to 22 tons. **800/331-6653; www.hammerheadtrenchless.com; Booth K265.**

Hannay Reels N700 Series

N700 Series reels from **Hannay Reels** are versatile reels used for pneumatic tools, water, high-pressure uses, lubrication, air, steam and general industrial applications. The standard N Series has a narrow frame to handle 1/4- through 1/2-inch I.D. hose, and a compact mounting base to be mounted on trucks, trailers and walls. These reels have four-way roller assembly, nonsparking ratchet assembly and declutching arbor to prevent damage from reverse winding. The standard inlet has a 90-degree balanced pressure swivel joint with 1/2-inch female NPT threads, and the standard outlet has 1/2-inch female NPT threads. **877/467-3357; www.hannay.com; Booth 2810.**

Herrenknecht Mechanized Tunnel Boring Machines

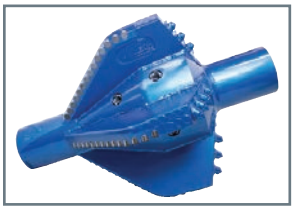
Mechanized tunnel boring machines from **Herrenknecht** can be used for all ground conditions and in diameters ranging from 4 inches to 62 feet. The product range includes tailor-made machines for transport tunnels (Traffic Tunneling) and supply and disposal tunnels (Utility Tunneling). Under the umbrella of the Herrenknecht Group, a team of specialists has formed to provide integrated solutions around tunnel construction with project-specific equipment and service packages. **253/447-2300; www.herrenknecht.com; Booth K241.**

Hyundai Construction Equipment Americas R35Z-9A

The **R35Z-9A** zero-tail swing excavator from **Hyundai Construction Equipment Americas** is powered by a 23.7 hp Yanmar engine. Its maximum digging depth is 10 feet 3 inches, and bucket breakout force is 6,900 ft-lbs. With a standard canopy, the unit has an operating weight of 7,800 pounds. It's also available with a cab. Standard bucket capacity is 0.14 cubic yards.

It includes a thumb bracket, large dozer blade, hydraulic quick-coupler, attachment-ready auxiliary piping and auto two-speed function. Its boom swing enables the operator to offset the boom 75 degrees left and 50 degrees right, enabling close work alongside foundations and in congested areas. **877/509-2254; www.hceamericas.com; Booth K345.**

Infinity Tool PDC Reamer



PDC Reamers from **Infinity Tool** are designed with a taper and a spiral that help make perfect holes, no matter the distance. The purpose of the taper is to centralize the reamer in the pilot hole to ensure a symmetrical hole is cut, equalize the size of the cut from side to side and enable the driller to ream from pilot to finish bore in the majority of holes. Pulling tabs are also available for all of Infinity Tool reamers. They are manufactured in push or pull body configuration, can be used both horizontally and vertically, and are designed for 25,000 psi compressive strength or less hard formations. **888/838-6657; www.infinitytoolmfg.com; Booth 3944.**

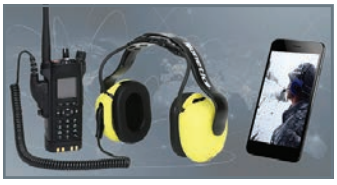
MB America Crusher

Crusher jaw crusher attachments for excavators, skid loaders, backhoes and loaders from **MB America** give contractors a versatile tool to navigate through narrow spaces and manage on-site processing. When contractors can crush on site, they produce reusable material, optimize productivity and eliminate the need to transport material to a third-party processing facility. MB also offers trommel screening attachments, 360-degree rotation grapples and rotary drum cutters. **855/622-7874; www.mbamerica.com; Booth 3422.**

Reelcraft Series HD70000

Series HD70000 hose reels from **Reelcraft** are designed to accommodate up to 100 feet of 3/8-inch or 75 feet of 1/2-inch I.D. hose. The heavy-duty base design, all steel construction and a baked-on powder-coat finish combine to produce a rugged, corrosion-resistant product. A redesigned latching mechanism provides longer service life of the latch components. The containerized drive spring offers safer and easier handling during maintenance. Two sealed ball bearings produce a smoother spool rotation and easier operation. The guide arm adjusts to seven positions for various mounting locations and applications. **800/444-3134; www.reelcraft.com; Booth 2339.**

Sonetics Wireless Headsets



Sonetics Wireless Headsets protect hearing and let crews of two to 20 communicate hands-free at the same time. They help improve productivity and safety on the job site by eliminating the mistakes that come from missed or misunderstood communication. Listen-through technology lets the user toggle the right amount of outside sound for a boost of awareness and safety. Teamwork improves as users stay in touch across the work zone and easily coordinate complex tasks with better focus and concentration. It helps users train in the moment, instruct for precision and correct mistakes instantly while the work continues. Other two-way radios or Bluetooth devices can be connected for even more options. **800/833-4558; www.soneticscorp.com/construction; Booth 3906.**

Subsite Electronics Commander 7

The **Commander 7** display from **Subsite Electronics** offers enhanced capabilities to the TK RECON Series HDD Guidance System and delivers all vital tracking data to both the tracker and drill operators. It is compatible with both Apple iOS and Android devices. It has an expanded communication range, fast data rate speeds and a large, high-resolution 7-inch screen with intuitive, user-friendly icons. It offers users three ways to view their tracker data, including an Advanced Drill-To mode with PerspectiveView, an intuitive leap forward in data presentation that the company claims is "truly out of the box." **800/846-2713; www.subsite.com; Booth K375.**

USA-Sign Compact C-Stands

Compact C-Stands from **USA-Sign** are made with a nonreflective vinyl roll up. Base sizes for the stands are available in standard or larger bases, and the legs come in galvanized steel or aluminum. They extend from 38 to 50 inches, and have leg release systems in Kick-Lever, T-Pin or Direct-Drive. The two-position, two-piece telescopic legs adjust for maximum stability and have built-in roll-up sign attachments in Spin-Handle or Quick-Attach. Wind-deflection systems are available in Leaf-Spring or Coil-Flex, and all stands are NCHRP-350 accepted for use with all roll-up signs. The Outrigger Beveled Button Snap enables faster work site tear down. **800/872-7446; www.usa-sign.com; Booth 3951.**

Vac-Tron Equipment Truck-Mounted PTO Series Vacuum Excavators

Truck Mounted PTO Series Vacuum Excavators from **Vac-Tron Equipment** include Hydro Truck Vac, which are available with 300- to 1,200–gallon debris tanks, 1,000 cfm blowers and 4-inch hose and tooling. The Jetter Truck Vac combines vacuum excavation with high-pressure jetter capabilities, with 1,000 cfm at 16 inches Hg vacuum blower, 800 to 1,200-gallon debris tanks, a 15 gpm at 3,000 psi jetter pump and 500 feet of 1/2-inch jetter hose. The Super Truck Vac is available with 500- to 1,200-gallon debris tanks, a 3,000 cfm PD vacuum blower and 6-inch hose and tooling. All come with a high-pressure water system, full hydraulic rear door, reverse pressure and Big Red filter housing that cleans air down to 0.5 microns. **888/822-8766; www.vactron.com; Booth K233.**

(continued)

Vacall Recycler

The **Vacall Recycler** continuous water recycling system is a green option for All-JetVac combination sewer cleaners that vacuum water from sewer lines, puts it through a five-step filtering process, then uses the same water to continue jetting. Located in the front of the debris tank for protection, the system includes a 240-gallon clean water tank attached to a 10 gpm pump and 50-foot hose reel for wash down. It offers automatic continuous filtering, with no filter change, no backflushing after cleanout work, no need for city water, no need to drive to refill the water tank, lower truck fuel use, minimal maintenance and a high throughput rate. **800/382-8302; www.vacall.com; Booth 4219.**

VACMASTERS System 6000

The **VACMASTERS System 6000** is the first air-vacuum excavation system with the power to trench as well as pothole. It is designed from the ground up to lower costs, reduce injuries and eliminate damage claims. The system uses supersonic air to penetrate, expand and explode the soil from within, while keeping it dry for easy vacuuming and quick backfilling. In turn, this will also increase revenues and profitability by doing more work in less time. **800/466-7825; www.vacmasters.com; Booth K222.**

Vactor Air-Only HXX Paradigm

The air-only version of the HXX Paradigm vacuum excavator from **Vactor Manufacturing** is equipped with the choice of air compressor rated at 185 cfm at 150 psi or 300 cfm at 250 psi. It can also be configured with several different water system configurations, including a wash-down system rated for 4 gpm at 2,500 psi equipped with a 100-gallon water tank, or a hydroexcavation system rated for 8 gpm at 2,500 psi equipped with a 300-gallon water tank. **800/627-3171; www.vactor.com; Booth 4906.**
Ad On Page 3

Barbco FlexBor

The FlexBor method from Barbco is designed to virtually eliminate inadvertent returns that are associated with horizontal directional drilling. It also reduces expenses by requiring one head to create the needed hole diameter and often shortening the length needed to install the product. This gets the machine's centerline on, or close to, the elevation of the proposed bore. The system protects wetlands from inadvertent release of drilling fluids in a cost-effective, environmentally safe trenchless manner. **800/448-8934; www.barbco.com; Booth K283.** ✦

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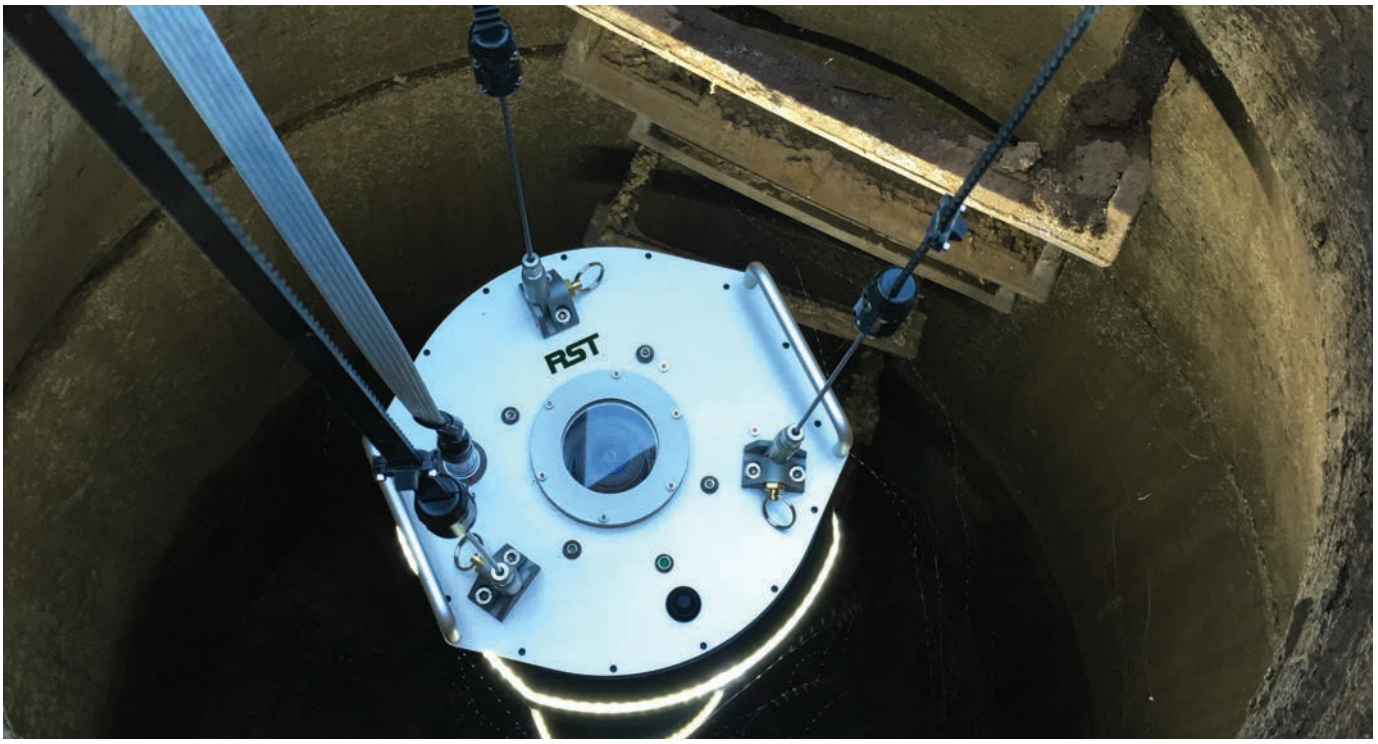

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FLOW CONTROL AND MONITORING

By Craig Mandli

Data Loggers and Management

1. Fluid Conservation Systems Pressure Transient Data Logger

The **Pressure Transient Data Logger** from **Fluid Conservation Systems** monitors water networks for damaging pressure transients, combating water hammer. With a five-year battery life, fast data sampling and large memory, the logger is suitable for both long-term surveys and rapid troubleshooting deployments. It has 4 GB of flash memory and uses advanced data compression algorithms to store up to 8 billion readings. It can operate in the field for weeks or even months while still sampling rapidly enough (25 Hz) to effectively monitor for pressure transients. It is supplied with a durable aluminum case containing the data logger, pressure transducer with quick-fit connector, download lead, software and full documentation. **800/531-5465; www.fluidconservation.com.**

2. Hermann Sewerin GmbH SePem 155

Systematic monitoring of a water pipe network with a **SePem 155** data logger from **Hermann Sewerin GmbH** lets users reliably identify existing leaks and catch new ones early on. It can report a leak after just one night. In a pipe network, water loss caused by a number of smaller leaks added together is likely to be considerably higher than the loss caused by a few spectacular pipe bursts visible on the surface. Noise loggers are capable of reliably detecting both types of leak sites: slowly growing and spontaneously occurring. It can be used for mobile or stationary monitoring of water supply networks. The SePem 01 Master, with its simple and intuitive menu navigation, provides fast and reliable results and can also be reliably operated by less experienced users. Measuring times and periods of radio activity are freely programmable. **888/592-9916; www.sewerin.com.**

Flow Control/Monitoring Equipment

3. ADS ECHO

The **ECHO** monitor from **ADS** provides utilities with an economical level-monitoring solution to provide early warning of preventable blockages such as FOG, root intrusion, silt/sediment and debris. Utilities can deploy a fleet of dozens or hundreds of level monitors with the flexibility to move units to multiple locations, such as problem sites where overflows occur or areas that require regular cleaning and maintenance. The monitor fits many applications, including comprehensive sewer performance monitoring, early warning and notification of sewer blockages and impending overflows, combined sewer overflow monitoring, sanitary sewer overflow monitoring, and sewer capacity studies. It is designed for ultralow power consumption, yielding up to a five-year battery life based on modem and data delivery rate configuration. It installs in less than 10 minutes with no confined-space entry required. **800/633-7246; www.adsenv.com.**

4. Aquarius Spectrum AQS-SYS

AQS-SYS from **Aquarius Spectrum** is a system for continuous water pipe monitoring and leak detection using permanently installed vibration and hydrophone sensors. Highly sensitive sensors — equipped with new-generation signal processing algorithms — monitor pipes of every type of material with high efficiency and wide coverage, typically using two sensors per kilometer of pipe. The sensors are equipped with 3G cellular communication modems and state-of-the-art synchronization modules that are capable of transferring large amounts of data and performing accurate correlations. Data analytics uses learning algorithms that perform adaptive signal filtering and multispectral correlations for leak detection. Entirely automated leak detection provides concise information on leak location and intensity. **www.aquarius-spectrum.com.**

5. Badger Meter ModMAG

ModMAG electromagnetic flowmeters from **Badger Meter** are well-suited for a diverse array of flow measurement applications in the water and wastewater treatment industry. With no moving parts in the flow stream, there is no pressure lost. Accuracy is not affected by temperature, pressure, viscosity or density, and there is practically no maintenance required. The monitor can be integrally mounted to the detector or can be remote mounted. These meters can accurately measure fluid flow, whether the fluid is water, highly corrosive liquid, or very viscous; contains a moderate amount of solids; or requires special handling. **800/876-3837; www.badgermeter.com.**

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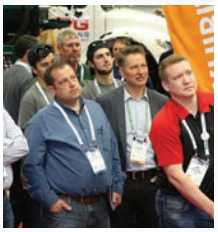

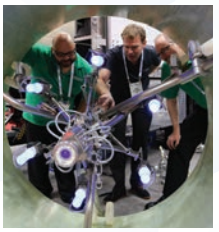

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6. Dwyer Instruments Series TUF Ultrasonic Energy Meter

The **Series TUF Ultrasonic Energy Meter** from **Dwyer Instruments** is an accurate, Class 2 energy meter. Through the use of ultrasonic technology, it measures heating and cooling energy consumption for a multitude of different applications, such as chillers, boilers, and/or tenant billing applications on large or small systems. It is an all-in-one accurate, compact flowmeter with integral communication, temperature meter and calculator. Users can keep maintenance to a minimum since it doesn't have any moving parts that are vulnerable to buildup. The eight-digit LED display allows users to easily read recorded values, including temperature, flow rate and energy consumption. It is offered in a variety of different pipe sizes and flow rates to more easily choose the correct unit for any application. **800/872-9141; www.dwyer-inst.com.**

7. Endress+Hauser Proline Prosonic Flow B 200

The **Proline Prosonic Flow B 200** from **Endress+Hauser** is an industry-optimized ultrasonic flowmeter for measuring biogas, landfill or digester gas without pressure loss. Technologies previously used in these applications were heavily influenced by moisture that was naturally carried in the stream, but the unit is designed specifically for such wet gases. It is a loop-powered, multivariable device for flow, temperature and methane measurements. It can directly calculate and output energy measurements to aid in the use of biogas as a cost-effective source of renewable energy. It provides process transparency, advanced diagnostic capabilities and a built-in method for traceable verification to ensure quality and compliance. It includes a two-chamber housing and worldwide approvals. It can be used in processes up to 159 psi and 176 degrees F. **888/363-7377; www.us.endress.com.**

8. Flygt - a Xylem Brand Concertor

The **Concertor** smart, interconnected wastewater pumping system from **Flygt - a Xylem Brand** senses the operating conditions of its environment, adapts its performance in real time, and provides feedback to pumping station operators. It offers energy savings of up to 70 percent compared to a conventional pumping system; it also reduces inventory by up to 80 percent due to flexible performance. Clog-free pumping operation and clean wet wells can save up to 80 percent in vacuum cleaning costs. Its compact design reduces cabinet size by up to 50 percent. It offers a wide performance field from which to choose the right operating point, making it simple and facilitating performance fine-tuning. **855/995-4261; www.xylem.com.**

9. Greyline Instruments MantaRay

The **MantaRay** portable area-velocity flowmeter from **Greyline Instruments** is designed for monitoring stormwater, sewage, industrial effluent, irrigation water, and natural streams through open channels, partially full sewer pipes, and surcharged pipes without a flume or weir. It uses a submerged ultrasonic sensor, which is hydrodynamically shaped and designed to shed deposits and stringers for reliable operation. To calibrate, enter the pipe diameter or channel dimensions; the unit automatically computes and displays the flow rate and total on its backlit LCD display. It allows users to monitor flow in real time, and displays and datalogs flow rate and total flow. It is powered by built-in, rechargeable batteries, or it can be connected externally to 12- or 24-volt DC batteries or a battery charger for continuous operation with 4-20 mA and relay outputs for connection to samplers, SCADA and telemetry systems. **888/473-9546; www.greyline.com.**

10. Matchpoint Water Asset Management Hydrins AMI

The **Hydrins AMI** flowmeter, developed by Hydreka and distributed by **Matchpoint Water Asset Management,** is a flowmeter that communicates with most AMR and AMI systems. It is a plug-and-play system, and that's an ideal option for flow data and setting up district metered areas. It is an easily deployable and cost-effective flowmeter, providing accurate bidirectional flow measurement for water distribution and raw water pipelines. The versatile unit is available in various lengths and is equally well-deployed for permanent integration within AMR/AMI radio systems. **910/509-7225; www.matchpointinc.us.**

11. PRIMEX ECO Smart Station

The **ECO Smart Station** from **PRIMEX** is housed in a multiple-compartment Arc Armor enclosure, reducing the risk of injury resulting from electric shock and exposure to arc flash. The control and power circuitry are isolated in separate compartments, preventing unnecessary exposure of arc flash to operators. It features the Energy View controller that's powered by kW Logix software, an energy-efficient solution. The color touch-screen HMI and comes equipped with an SD memory card for data storage and download, and provides level control, pump alternation, flow monitoring, data logging, alarm logging, and historical trending. It can connect through multiple communication streams for remote monitoring and control. It uses the latest variable frequency drive, microprocessor-based controller, data storage, and communication capabilities and technology. This pre-engineered system is available in 29 models from 10-100 HP. It is UL/cUL Listed. **844/477-4639; www.primexcontrols.com.**

12. Proco Products ProFlex 790

The **ProFlex 790** low-headloss, in-line, rubber duckbill check valve from **Proco Products** allows for a passive flow and enables the valve to be installed without having to do any modifications to existing structures or preinstall planning. The fold-away design of the inner sleeve allows for a near full port

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flow, allowing for quick drainage. It provides rapid dispersion of head pressures, and with its low cracking pressure, it prevents upstream flooding. Its zero backflow design makes it a fit for combined sewer overflows, sanitary sewer overflows and outfalls. **800/344-3246; www.procoproducts.com.**

13. Sierra Instruments InnovaSonic 207i

The **InnovaSonic 207i** transit-time ultrasonic liquid flowmeter from **Sierra Instruments** has thermal energy/BTU capability for superior flow measurement. Designed for nonintrusive liquid flowmetering, and optimized for thermal energy/BTU measurement, the unit is the ideal turnkey solution for building and district metering and submetering. It calculates thermal energy/BTU by determining the amount of heat transferred between the cold and hot flow legs of a heating or cooling process. This provides end users with the high-quality flow energy data required to manage energy costs. **800/866-0200; www.sierrainstruments.com.**

14. SmartCover Systems SmartFLOE

The **SmartFLOE** flow estimation system from **SmartCover Systems** provides a low-cost and low-maintenance method for remote flow measurement and communication. It can be used to provide reliable flow measurements or calibrated to a previously calibrated flow instrument. Knowledge of flow conditions during wet weather events compared to dry weather flow can help support a rigorous infiltration and inflow assessment program and identify capacity issues. With user-definable alarm settings, the system can warn of impending overflow issues before they occur, communicating to personnel via email or text. Users are kept informed of the system's operating status so that maintenance and preventive measures can be planned well in advance. Field hardware can be installed and serviced with no confined-space entry. **760/291-1980; www.smartcoversystems.com.**

15. Telog, A Trimble Company, RTU

The **RTU** from **Telog, A Trimble Company,** can easily be connected to existing flowmeters and supports multiple sensor interface options, including RS-232, RS-485, analog and digital inputs. For example, when connected to an open-channel flowmeter via RS-232 or RS-485, the RTU can interrogate the meter for its most recent level, flow velocity and battery voltage measurements. Alternatively, FloWav PSA-AV area-velocity flow sensors connect directly to the RTU for monitoring open-channel flow. Optional sensors are available that may be directly attached to the RTU, including ultrasonic and pressure level, water-quality sondes, temperature, level switches and a rain gauge. RTUs are battery powered, wireless, and built to withstand harsh sewer environments, so they can be located virtually anywhere there is a flowmeter or A/V sensor for flow. **585/742-3000; www.trimblewater.com.**

Meters

16. Metron-Farnier Voyager Hydrant Meter

The **Voyager Hydrant Meter** from **Metron-Farnier** provides a flow range suitable for measuring hydrants and other construction service applications. The lightweight, top-loading meter can be fitted for any utility or construction requirements. The meter, with an innov8-VN Verizon Wireless Cellular Register, conveniently provides readings via Metron's Water Scope Web Portal to see where every drop is going and eliminate the headaches of recovery and tampering. A GPS option is available. **800/763-8766; www.metronfarnier.com.**

17. PMC Engineering MTM 3000 Series

The **MTM 3000 Series** miniature submersible transmitter from **PMC Engineering** is designed for depth and level measurements of groundwater, wastewater and seawater where space is limited. Pressure ranges from 0-10 to 0-500 psi. Operating temperature is 25 to 125 degrees F. The 0.39-inch titanium housing offers high performance in very small areas, such as 1/2-inch monitoring wells, stand pipes and boreholes. The highly developed, piezoresistive sensing technology provides high accuracy of 0.1 percent and long-term stability of better than 0.1 percent per year. The technology also provides a high overpressure of at least three times the rated range without any degradation of sensor performance. When used with the MP 11 moisture protection option, the user can expect maintenance-free operation for an extended period of time, typically more than 10 years. **203/792-8686; www.pmc1.com.**

Sensors

18. FCI - Fluid Components International FlexSwitch FLT93 Flow Switch

The **FlexSwitch FLT93 Flow Switch** from **FCI - Fluid Components International** reduces pump repair and extends life by detecting dry running conditions. It monitors the flow and temperature of liquids, gases and slurries. It is ideal for pump wet/dry detection, where unexpected reductions in media flow rates can leave pumps vulnerable to overheating damage. With Alarm 1, the switch detects a low flow situation between 0.01 and 3 feet per second. This low flow alarm is a prewarning signal. The system operator can then decide to keep the pump running or to shut it down. If an Alarm 2 occurs because the pump feed line is running dry, this is a signal to shut down the pump because the bearings now see gas — instead of a liquid — as a heat transfer media. **760/744-6950; www.fluidcomponents.com.**

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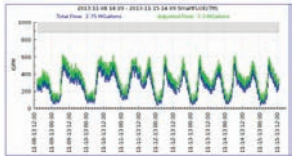

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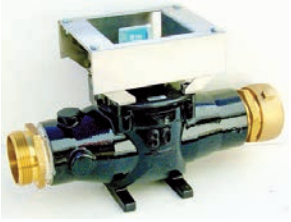

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19. Itron leak sensor

Itron's leak sensor, part of the OpenWay Riva solution, provides acoustic leak detection to help utilities identify leaks before they become a major problem, reducing waste and cost long-term. Strategically placed sensors analyze sound patterns to detect new and existing leaks and send the data directly to the utility, making sure they are aware of even the smallest leaks automatically. **866/374-8766; www.itron.com.**

20. Real Tech Real Spectrum UV-VIS

Real Spectrum UV-VIS sensors from **Real Tech** provide instant visibility into wastewater by delivering real-time accurate BOD data. The sensors can monitor up to 120,000 mg/L BOD with optional dilution system to meet the demands of various wastewater applications. Automatic chemical cleaning and purging systems minimize maintenance and ensure reliability in harsh environments. The sensor and optional accessories connect to a central controller that offers multiple communication options for easy integration to a SCADA system. With up to the minute BOD insights, important events can be detected prior to the five-day laboratory results, helping operators to control and optimize wastewater treatment processes. As a result, energy and chemical usage can be reduced to save costs while improving water quality. **905/665-6888; www.realtechwater.com.**

Software

21. iWater infraMAP

The **infraMAP** software system from **iWater** is a GPS-guided mobile GIS solution that allows seamless data collection and updates to a utility's asset management program. This easy-to-use software is geared toward field crews and doesn't require GIS experience. It can be used to economically and conveniently monitor water and wastewater infrastructure assets at an optimized level in order to provide greater efficiency returns and customer service benefits. **877/482-5834; www.inframapsoftware.com.**

22. SmartPhone Meter Reading solution

SmartPhone Meter Reading allows users to read, install or change meters, or even manage AMR and AMI installations. They can turn service connections on and off using any smartphone's built-in GPS, camera, internet and mapping capabilities. It can be used to find meters using Google Maps, geo-locate assets, validate work and readings with GPS and photos, download routes and work lists from anywhere, or upload readings and completed work tickets in real time. No paper or expensive equipment is required. **214/215-2665; www.smartphonemeterreading.com.**

23. SplashLink project finding

The project finding feature from **SplashLink** allows users to search thousands of sources daily and curate imperative information, enabling them to expand an organization's project portfolio. It hosts projects from municipalities, private organizations, and utilities looking for expertise or equipment related to flow control and monitoring, AMI/AMR, construction, and engineering. In addition, the platform provides insight into data, based on the actual performance of the market. **844/877-5274; www.splashlink.com.** ✦

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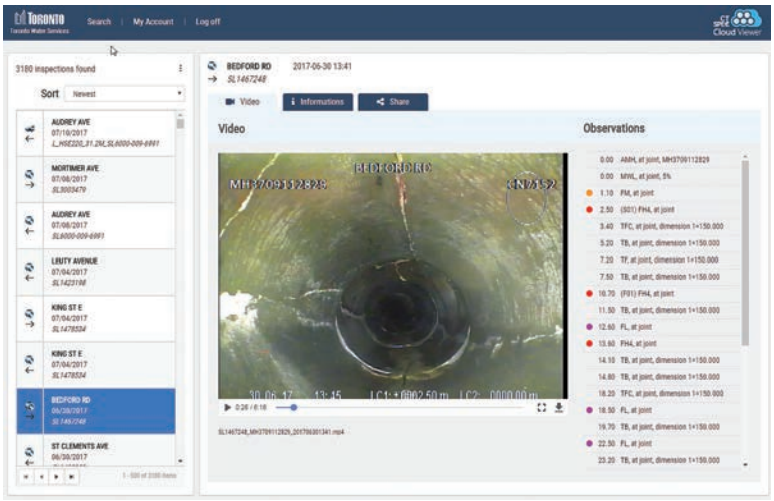
City seeks solution to eliminate data capture errors



Problem:

The city of Toronto sought to create and facilitate access to a complete asset inventory that would virtually eliminate all errors during the inspection data capture.

Solution:

By choosing **CTSpec Sewer,** the city became aware of the complete inventory of sewer assets, including pipe and manhole conditions. The solution was rapidly adopted by the contractor responsible for the sewer asset inspections and ensuring continuity and accuracy throughout the chain of information — from the field data collection to its processing by city analysts and engineers. A single solution (covering asset inspection all the way through to report preparation) made it possible to provide a consistent, comprehensive approach to information management.

RESULT:

All of the city's teams were able to increase their productivity because of the automated update of infrastructure conditions, the production of thematic maps, and the improvement of information sharing. Information was highly reliable, allowing analysts to focus their efforts on asset management and operational priorities. It is easy to produce specific reports on the condition of sewer systems and the need for inspection, maintenance, and repair operations. **888/965-8987; www.ctspec.com.**

Ultrasonic water meters help city increase water revenue

Problem:

The town of Dexter, New Mexico, had old positive displacement meters. The moving parts inside the meters had worn over time, and the city was losing revenue for water they were distributing to customers. Wear and tear caused the discs to rotate less and therefore measure less water volume.

Solution:

The town replaced their meters with **Kamstrup Water Metering** ultrasonic water meters. Ultrasonic meters have no moving parts, which benefits water systems in two ways: they measure lower flows and do not lose accuracy over time.

RESULT:

When comparing usage between November 2015 and 2016, the town of Dexter billed 1 million more gallons with the new ultrasonic water meters. "We are excited [about] the long-term benefits [this] will provide to our water department and our community," says Yolanda Alvarez, utility clerk for town of Dexter. **440/835-6716; www.kamstrup.com.**

Automatic flushing system restores chlorine residual

Problem:

Halifax Water (Halifax, Nova Scotia) provides potable water, wastewater and stormwater services to 86,000 customers. When a local car wash shut down, its water connection needed to be closed. As a result, there was nonmovement through this section of the main, which contributed to a decrease in chlorine residual. To ensure water safety levels were met, weekly flushing of a nearby hydrant was required, which was costly, time consuming, and contributed to nonrevenue water loss.

Solution:

The hydrant was replaced with a **Hydro-Guard HG-4 LongNeck Sub-Surface Direct Discharge Unit** from **Mueller Co.,** housed in a natural-look-

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ing rock cover. It has the capability of flushing, dechlorinating and expelling the water into a storm sewer in an environmentally safe manner. After a series of tests to determine optimal location and flush times, Halifax Water staff easily programmed the ideal sequence to achieve the best results.

RESULT:

Site visits have been reduced from eight to one per month, a savings of $14,700 annually. Water loss for flushing has decreased by 28 percent, and the optimal flushing schedule has resulted in steady chlorine residual levels. Aggregate costs have fallen from $42,000 to $24,750 within the past two years, a total savings of $17,250 after installation. **800/423-1323; www.muellercompany.com.**

Control valve stops cavitation caused by varying summer and winter demand

Problem:

The Hutchinson, Kansas, water plant distributes water through mixing butterfly valves that were designed for high summer demand. The low winter demand created inlet pressure variations from 90 to 50 psi while the outlet pressure was 10 psi. Consequently, there was severe cavitation and the valves were failing after just two years.

Solution:

The simplest, most cost-effective solution was a pressure-reducing valve with anti-cavitation trim in front of the plant. In this case, the valve would take the main pressure drop while the mixing butterfly valves would be used for trimming the flow. They installed a 20-inch **S106-PR-AC** pressure-reducing valve from **Singer** because it has a single rolling diaphragm that provides smooth, steady and precise pressure control from maximum to virtually zero flow.

RESULT:

Once the valve was put in place, the unbearable sound from cavitation was no longer present, and now there is consistent, reliable flow and pressure to deliver up to 10 mgd. Going forward, the city should no longer have to incur the costs of replacing the valves on an annual or biannual basis. **888/764-7858; www.singervalve.com.** ✦

Product Spotlight

Two-component system provides single-day manhole rehabilitation

By Craig Mandli

Rehabilitating a leaky manhole can be a time-consuming and labor-intensive job. That is unless, of course, you have the right system for the job. The Mainstay Composite Liner system from Madewell Products Corporation is just such a system.

The two-component manhole rehabilitation system consists of a high-strength restoration mortar, such as Madewell Products Corporation's Mainstay ML-72 Microsilica Restoration Mortar, and an epoxy corrosion barrier coating, such as Mainstay DS-4 or -5 Epoxy Coating, that cures simultaneously to repair and protect brick and concrete manholes and other sanitary sewer structures.

"Being able to spray the epoxy on wet mortar is a big time saver, and it creates a strong adhesion rate," says Craig Closser, sales manager for Madewell. "Typically the rule of manhole rehab is you can't put epoxy on a wet surface. Well, we can."

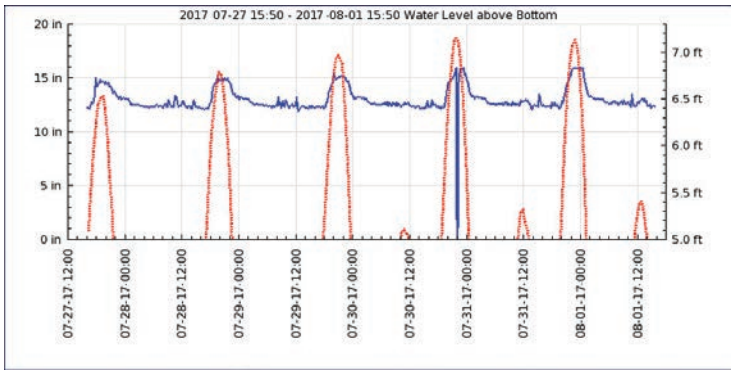
The mortar is first shot onto a new or deteriorated manhole substrate, and an epoxy topcoat is then immediately applied while the mortar is still soft. The simultaneous combination of these materials creates a monolithic lining that cures into a strong, corrosion-resistant and continuous surface, free of pinholes and voids. The mortar and topcoat are tightly bonded not only to the manhole substrate, but also to each other. There is no wait time for the mortar to cure after it is applied to the manhole because the epoxy topcoat is applied while the mortar is still soft. Therefore, the system can be installed quickly and deteriorated manholes and other structures can be repaired and put back into service in a single day.

"It sticks beautifully, almost like putting sealer on a driveway," says Closser. "It has a 50-year design life, so you know it's going to last."

Because the surfaces in manholes and lift stations are often continuously damp, it can be nearly impossible to apply a typical protective coating alone. However, the products used in the Mainstay Composite Liner are properly applied when the surface is damp, eliminating the time-consuming and difficult task of drying the substrate prior to application.

"The mortar is extremely user-friendly," Closser says. "It can be applied up to 5 inches thick in one pass."

The cured mortar has a compressive strength of 10,000 psi, resulting in a restored manhole that is stronger than the original structure. The system is designed for lining manholes and other pipeline systems from 18 to 72 inches in diameter. **800/741-8199; www.madewell.net.**



SmartCover Systems StreamWatch

SmartCover Systems StreamWatch

The new StreamWatch from SmartCover Systems provides real-time river and stream level data, integrating it with collections system level and flow data to create a comprehensive cause-and-effect picture. Because river and stream levels can cause collections system infiltration, StreamWatch enables users to see the relationship and effect of river/stream levels on collections system levels and flows. For inflow and infiltration tracking and assessment, StreamWatch has the ability create exceptional Collection Systems Visibility. StreamWatch is the latest addition to the company's data sets that reveal I&I sources, including tide and rain data. They can be used to gain a comprehensive understanding of I&I and their effects on the collections system. **760/291-1980; www.smartcoversystems.com.**

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Leading Lateral Launch

with rausch USA

Rausch lateral launch systems are industry leading, and have been since their debut. The M-Series modular design means just one crawler is used for many different applications.

The same crawler which performs mainline inspections is upgraded to perform lateral launches within 60 seconds by changing the quick-connect modules which mount directly to the electric lift of the L 135.

The system features a top-mounted launch module and a positioning module which rotates and directs the lateral camera into greater than 90° taps at any clock location within the mainline pipe - with or against the flow.

Modular. Powerful. Quality.

The Rausch KS 60 CL pan and tilt lateral camera is launched up to 150 feet into the lateral - and with the steering pin, can negotiate branched laterals.

When lateral inspection is complete, operators can switch back to the mainline camera with ease.

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Schweitzer Engineering Laboratories pump automation controller

The SEL-2411P pump automation controller from Schweitzer Engineering Laboratories is a preconfigured SCADA-ready device built for unforgiving water and wastewater environments. Terminal labeling makes installation easy. The controller provides secure, user-accessible programming to facilitate system upgrades and expand functionality. It can monitor and control liquid levels for simplex, duplex, or triplex applications in wells, reservoirs, or lift stations. It can also control constant-speed, variable-speed and alternating pumps. It is compatible with analog level sensors, floats or a combination of both. **509/336-2527; www.selinc.com/p258.**

Schweitzer SEL_2411P

Envirosight reference guide to sewer inspection and maintenance

Envirosight's free guide to sewer inspection and maintenance serves as an introduction for industry newcomers. "Sewer Maintenance 101: The Quick and Dirty Guide to Sewer Inspection and Upkeep" provides an overview of how a sewer system functions, how it's inspected and how it's maintained. It can serve as a tool for industry orientation or provide a refresher to employees already in the industry. **866-936-8476; www.envirosight.com.**

Envirosight dewer maintenance guide

General Pipe Cleaners, div of General Wire Spring Co., Flexicore closet augers

Flexicore closet augers from General Pipe Cleaners, div of General Wire Spring Co., are made of two layers of tempered spring steel coiled tightly over a core of 49-strand wire rope for kink resistance. It has 3 feet of cable telescoped inside the guide tube, providing an additional 3 feet of cable when needed. The optional down head follows the contours of the bowl and springs through sharply angled passages while protecting inner walls from chipping or breaking. Three vent holes let the auger dry between jobs. **800/245-6200; www.drainbrain.com.**

General closet auger

Fuji Electric Corp. of America spool-type ultrasonic flowmeter

Fuji Electric Corp. of America's spool-type ultrasonic flowmeter uses wetted sensors for precision accuracy and offers a selectable panel position. It offers event triggered alarms and configurable bidirectional range for both forward and reverse flow. If offers a backlit, 16-digit, two-line LCD display and can be configured to present data in Japanese, English, German, French or Spanish. **732/560-9410; www.fujielectric.com.**

Fuji Electric Spool-type ultrasonic flowmeter

Victaulic Style W257 dynamic movement joint

The Style W257 dynamic movement joint from Victaulic is preassembled and reduces installation complexity to threaded rod installations of the AWWA M11 harness and C219 bolted sleeve-type joints. It can accommodate differential settlement and seismic movement in large-diameter piping systems and is comprised of Victaulic's AGS Flexible Coupling Style W77. The couplings are self-aligning and provide a visual confirmation of proper assembly from the metal-to-metal bold pad contact. The joint is available in 14- to 78-inch DN350 to DN1950 sizes and is designed to be direct buried, using epoxy coating compliant with NSF61 and AWWA C210, and stainless steel hardware. **610-559-3300; www.victaulic.com.**

Victaulic Style W257

StoneAge Tools AutoPacks

AutoPacks from StoneAge Tools are available for the ABX-3L and ABX-2L triple- and dual-lance tube cleaning systems. The self-contained automated equipment kits contain all the components and accessories needed to perform fully automated heat exchanger cleaning. Features include customized storage inserts to allow for quick visual inventory management and a job box to protect equipment, simplify transport and minimize setup time. **970/259-2869; www.stoneagetools.com.** ✦

StoneAge AutoPacks

InfoSense Sewer Line Rapid Assessment Tool inspection standard released

The American Society for Testing and Materials recently released a new standard based on InfoSense's SL-RAT technology for inspecting gravity sewers. The standard F3220-17 provides a basis for municipal collections system operators, consulting engineers, and their associated contractors to work from when developing specifications for sewer cleaning and maintenance programs.

HOBAS Pipe USA infrastructure investments

HOBAS Pipe USA recently invested in a new custom-manufactured water jet saw at its Houston plant to allow for more precise control of centrifugally cast, fiberglass-reinforced polymer mortar fittings. Cutting is done in a wet environment, so no dust is generated as it was with past methods.

Plastics Pipe Institute award winners announced

Plastics Pipe Institute project winners

The Plastics Pipe Institute announced its winners for the Members and Projects of the Year Awards Program. Winners were chosen based on outstanding service contributions and exceptional achievements that showcased beneficial uses of plastics in pipe applications. In total, four projects and five individuals were honored.

Pipeline Renewal Technologies releases logbook

The Pipeline Renewal Technologies full-color logbook encourages and simplifies routine maintenance for sewer rehab cutters. It features checklists and sign-offs for the start and end of each working day as well as weekly maintenance steps.

Envirosight welcomes regional sales manager

Envirosight announced that they have hired Mike Putney as the northeast regional sales manager. Putney has more than 20 years' experience in sales and account management, including 10 years with Supreme Corporation where he served most recently as the director of sales for the northeast.

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HammerHead Trenchless name change

HammerHead Trenchless Equipment will now be referred to as HammerHead Trenchless to better summarize the full range of solutions offered to the industry.

SmartCover Systems' new regional sales manager

SmartCover Systems named Glen A. Hill as regional sales manager for the newly configured southern region. He comes to SmartCover Systems with more than 27 years' sales and engineering experience, and he is licensed in South Carolina, Florida and Texas.

Thompson Pipe Group acquires U.S. Pipe, a division of Forterra

Thompson Pipe Group agreed to acquire the concrete and steel pressure pipe assets of U.S. Pipe, a division of Forterra. The new entity will operate under the name Thompson Pipe Group, and it will be headquartered in Rialto, California.

Bio-Microbics receives award

Bio-Microbics received the 2017 North American Integrated Water Treatment Technology Award from Frost & Sullivan. The award was presented on the basis of overcoming industry challenges and leveraging business impact with a commitment to innovation, creativity, and technology incubation.

Bob Frost of Bio-Microbics

Subsite Electronics acquires R.S. Technical Services

Subsite Electronics announced the acquisition of the assets of R.S. Technical Services. The deal adds camera inspection capabilities to Subsite Electronics' line of underground awareness solutions. Operations will continue in Petaluma, California, and Mount Sterling, Kentucky. R.S. Technical Services products will continue to be available through the current R.S. Technical Services dealer network.

NASSCO joins the Utility Engineering and Surveying Institute as a Charter Organizational Member

NASSCO was named a Charter Organizational Member of the UESI of the American Society of Civil Engineers. UESI's mission is to meet infrastructure challenges by reducing project life cycle costs by 50 percent by 2025.

Vermeer Great Plains offers employee stock incentives

Vermeer Great Plains, with locations in Kansas, Oklahoma and western Missouri, is now 100 percent employee-owned through an employee stock ownership program. As part of the new ESOP structure, Scott Ryals, former general manager, has taken on responsibilities as CEO.

KNIPEX Tools moves headquarters

KNIPEX Tools moved its headquarters to Buffalo Grove, Illinois, from its previous location in Arlington Heights, Illinois. The new space is a renovated 53,200-square-foot combined office and warehouse facility. ✦

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WORTH NOTING

PEOPLE/AWARDS

Adam Grim was named the stormwater coordinator/GIS technician for the city of Ottawa, Kansas. Grim is the first person to hold the newly created position.

Lincoln Property Company beat out 63 other businesses to receive the 2017 Stormwater Management and Water Quality Award from the city of Westborough, Massachusetts.

Dan Johnson, who has been an employee at the city of Joplin (Missouri) Public Works for 12 years, was named the assistant director of the engineering division. Johnson, an engineer, designed the city's stormwater drainage and sanitary sewer systems during his tenure.

The **city of Otho,** Iowa, received a $274,411 Community Development Block Grant from the Iowa Economic Development Authority. Efforts supported by the funds will go toward reducing the amount of inflow and infiltration of stormwater into Otho's sanitary sewers.

The **New England Stormwater Collaborative** presented New England Stormy Awards to these Massachusetts entities:

- The town of Westford Engineering Department for its "building community support for stormwater through Westford's living lab" program;
- The city of Quincy for its "clean water is everybody's business" program;
- Worcester Polytechnic Institute's Massachusetts Water Resource Outreach Center for its "partnering university students, state regulators and municipalities for NPDES MS4 permit compliance" program.

The **town of Shelburne,** Vermont, received a $12,395 grant from the Vermont Department of Environmental Conservation to help fund stormwater system improvements on Brook Lane.

The Florida Department of Environmental Protection gave $800,000 to the **city of Cape Coral** for stormwater projects, and $250,000 to the **town of Fort Myers Beach** for stormwater projects.

LEARNING OPPORTUNITIES

New Jersey

The American Water Works Association is offering a workshop titled Understanding Advanced Stormwater Management Techniques on Oct. 23 in New Brunswick, New Jersey. Visit www.awwa.org.

Wisconsin

The University of Wisconsin–Madison is offering the following learning opportunities:

- Oct. 11-13 – Essentials of Hydraulics for Civil and Environmental Professionals seminar
- Feb. 27-28 – Using WinSLAMM v10.2: Meeting Urban Stormwater Management Goals

Visit www.epd.wisc.edu. ✦

CALENDAR

Oct. 8-11
American Society of Civil Engineers 2017 Convention, New Orleans Marriott, New Orleans. Call 800/548-2723 or visit www.asce.org.

Oct. 17-20
National Utility Contractors Association Fall Leadership Conference, Coeur d'Alene Resort, Coeur d'Alene, Idaho. Visit www.nuca.com.

Oct. 30-Nov. 2
American Water Works Association Water Infrastructure Conference & Exposition, Westin Galleria Houston, Houston. Visit www.awwa.org.

Nov. 5-9
American Water Resources Association Annual Conference, Red Lion on the River-Jantzen Beach Hotel, Portland, Oregon. Visit www.awra.org.

Nov. 6-9
American Society of Civil Engineers' Operation & Maintenance of Stormwater Control Measures, Denver. Visit www.asce.org.

Dec. 6-8
Florida Stormwater Association's Winter Conference, Hilton Orlando, Orlando, Florida. Visit www.florida-stormwater.org.

Feb. 20-23
Water Environment Federation's Utility Management Conference, Hyatt Regency Riverwalk, San Antonio. Visit www.wef.org.

March 6-9
National Utility Contractors Association's Annual Convention, Wyndham San Antonio Riverwalk, San Antonio. Visit www.nuca.com.

April 22-25
American Water Resources Association Spring Specialty Conference: GIS and Water Resources, Rosen Centre Hotel, Orlando, Florida. Visit www.awra.org.

Municipal Sewer & Water *invites your national, state or local association to post notices and news items in this column. Send contributions to editor@mswmag.com.*

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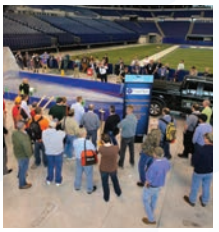

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