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> Willis Spencer Public Works Supervisor Baltimore, Md.

FOR SANITARY, STORM AND WATER SYSTEM MAINTENANCE PROFESSIONALS August 2013 www.mswmag.com

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INSIDE:

PIPELINE INSPECTION. SURVEYING AND MAPPING









ON THE COVER:

Baltimore City Department of Public Works Supervisor Willis Spencer heads a residential service call for a water main break. The department is using fiber optic cable to monitor changing conditions in a 5.8-mile run of Class IV prestressed concrete pipe. (Photography by Matt Roth)



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EDITORIAL CORRESPONDENCE: Send to Editor, *Municipal Sever & Water*, P.O. Box 220, Three Lakes, WI, 54562 or email editor@mswmag.com.

REPRINTS AND BACK ISSUES: Visit www.mswmag.com for options and pricing. To order reprints, call Jeff Lane at 800-257-7222 (715-546-3346) or email jeffl@colepublishing.com. To order back issues, call Nicole at 800-257-7222 (715-546-3346) or email nicolel@colepublishing.com.

CIRCULATION: 2012 average circulation was 40,581 copies per month (U.S. and international distribution).



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THE PROBLEMS OF THE DAY

Solving the issues that plague your system is an ongoing battle, and it's all part of the job

ost people working in the municipal sewer and water field have dealt with the problems associated with aging infrastructure. In many older cities, it's not at all uncommon for pipes laid a hundred years ago to still be delivering water and collecting wastewater. The amazing thing is that these pipes have survived when some newer pipe technologies have failed in less than half that length of time.

The City of Baltimore, Md., profiled in this issue of *MSW*, is a great example. Baltimore's Bureau of Water and Wastewater operates a 1,583-mile network of water mains. Nearly 900 miles in the system — more than half of the water mains — are more than 80 years old and water is still flowing through almost 55 miles of mains that were built prior to 1900.

Infrastructure of that age presents its share of problems, but it's not Baltimore's biggest problem. The bureau's Southwest Transmission Main



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FROM THE EDITOR

Luke Laggis

is one of several key conduits in its distribution system that were installed in the mid-1970s and constructed with troublesome Class IV PCCP pipes that have been prone to early failure due to breaks in the prestressed wires embedded in the outer layer of the pipe.

To combat the problem, the bureau has implemented an inspection and warning system to alert operators of changing conditions within the pipes, so issues can be addressed before catastrophic failures make the situation far worse. The proactive approach is a significant expense, but it saves a lot of headaches for the bureau and local residents. And proactive

Proactive maintenance and repair is always a better solution than handling problems on an emergency basis. maintenance and repair is always a better solution than handling problems on an emergency basis.

Most municipalities are dealing with these types of problems, if not with prestressed concrete pipe, then with something else root intrusion in failing joints, corrosion in cast iron or a myriad

of other issues common to wastewater systems. The stories fill these pages every month, but more important are the successes we highlight every month, providing greater insight on the potential solutions for the problems in your system.

An old problem

Dealing with distribution and collection system problems is nothing new, as you all know. It's been going on since the advent of sewer systems. A blog on *The New York Times* website chronicled the history of some of Manhattan's early wooden water pipes, which were recently pulled from the ground, still intact with the original wrought iron connectors that held sections of the hollowed-out pine logs together.

The wooden pipes, which were susceptible to leaks, low pressure and invading roots, were still being installed even as other contractors and municipalities moved to cast iron. So the city dealt with the problems inherent in these pipes until eventually they were all taken out of service.

While you may never pull a wooden pipe from below your city streets, you'll all deal with failing pipe and the need to improve your systems. It's part of the job, along with finding the solutions that best fit your customers' needs. I hope this publication can help you in those endeavors.

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.



RAKING The GRADE

This is the third in a series of case studies chronicling intricate sewer installations completed using the AXIS[®] guided boring system. The previous installments appeared in the March and May issues.

Scenic places; tight spaces the perfect setting for the AXIS system

Imagine owning a million-dollar home, situated along the Canadian shore of scenic Lake Ontario, where the only thing standing between you and a view of a spectacular evening sunset is of all things — a sewer pump station.

Such was the case for several homeowners whose properties, located at the far end of Timber Lane in the community of Oakville, Ontario, face directly toward this aging sewer eyesore.

"Over the years, the saga of the pump station had progressed to the point where the city had decided the best solution would be to install a gravity sewer," says Jason Kottelenberg, contract manager with AVERTEX.

Oakville city officials became intrigued by the AXIS® laser guided boring system at an AVERTEX-sponsored event, and felt the innovative trenchless approach could be the long-awaited answer to their dilemma.

Kottelenberg felt confident recommending the AXIS system for the Oakville project. The on-grade requirement alone wasn't the only consideration; preserving the integrity of this tree-lined setting was actually Kottelenberg's primary motivation.

"Open-cut was not an option," Kottelenberg says. "Given the narrow streets, established trees, expensive homes, limited access and the need to maintain the integrity of the neighborhood — as much as possible — trenchless was the only option."

The plan called for installing a 10-inch (25.4 cm) diameter LPVC gravity sewer at 0.6 percent grade. In mapping the installation route for the AXIS laser guided boring system, Kottelenberg plotted a series of six consecutive launch pits — ranging from 13 to 30 feet (4 to 9.1 m) deep — and from 130 to 393 feet (40 to 119.8 m) apart.

Given the confined environment, AVERTEX was forced to utilize a compact pit design. Soil samples indicated a layer of shale beneath approximately 16 feet (4.9 m) of soil, so after reviewing the various options, Kottelenberg felt slide rail shoring would be the safest.

"The most difficult part of the project was excavating the pits," Kottelenberg says. "Four of the six pits had to be dug down 26 to 30 feet (7.9 to 9.1 m). It took a week just to dig a pit. But once those were completed, with the AXIS system lined up and ready for the shot, this was the simple approach because shale is easy and consistent, tolerance-wise. The nice part about the AXIS system is that once we were set up, we knew it would be accurate."

Once the first pit was completed and the various components of the AXIS system secured, it took about three days to complete a bore. Crews worked in advance of the boring activity of the AXIS system

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to ready the next bore, which in turn, served as the launch pit for the second bore, and so forth down the line.

"Toward the end, we came out of the shale into the clay and the drill head started to dip down a little, because the clay was so soft," he says. "We employed a couple of different techniques to fill in the hole and reshoot using another head. Ultimately, we got through and the AXIS system performed beautifully."

In the end, the new gravity sewer line — spanning 1640 feet (499.9 m) in all — flowed like a charm. Residents of this refined lake-view community no longer have to contend with the noise and obstruction of the unsightly pump station.

"With respect to this project, if it wasn't for the AXIS laser guided boring system, we wouldn't have been able to complete the job," Kottelenberg says. "Given

the extremely precise grade of 0.6 percent, it would have been difficult to implement a traditional HDD approach. Ultimately, laser-guided technology made the job feasible."



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EDITOR'S CHOICE

Read More Stories That Impact Your Utility at MSWmag.com

By Luke Laggis

e're posting valuable new content every day at MSWmag. com. In addition to everything you see on these pages, the site features a wealth of product and industry information, as well as blogs and original features you won't find in print. The following are just a few of the items you're missing if you're not visiting the website.

3 Leak Detection Tools Every Utility Needs

Limiting sewer line inflow and infiltration requires a dedicated maintenance program and tools that can assess pipe condition and note areas of concern. Cameras, smokers and locators might be ways to identify leaks, but are these tools every utility should have in its toolbox? Yes and no, says Duane Johnson, vice president at Affordable Pipeline Services in San Diego and a former CCTV inspection operator and flow monitoring field technician. "What it really comes down to is agency size," he says. A smaller utility with limited staff might be better off outsourcing its leak detecting, whereas a larger utility with a 20-member dedicated sewer department might find it more economical to budget \$150,000 for a camera system and \$200,000 a year for staffing.

Transitioning From a Reactive to a Preventive O&M Program

A sanitary sewer pumping station is a vital element of any community's infrastructure and a critical component of the wastewater collection system. Different levels of O&M standards are necessary for large and small communities. Reactive maintenance methods involve crisis management, and goals are often as simple as maintaining sewer flows inside the collection system. Preventive methods include scheduled maintenance and repairs throughout the system including all individual elements. Predictive management methods are an attempt to manage a system and its components based on historical data and its performance as it ages.

Basic Tools to Have on Hand for Pipeline Inspections

In the pipeline inspection industry, drain cleaners and plumbers sometimes focus only on the inspection equipment — cameras, crawlers, cable and cable reels. While all of these are essential to properly inspect sewer lines and laterals, some basic tools are just as important to have on hand. If the right tool is not kept on the inspection van, inspections can come to a standstill. The day could be a complete loss if a manhole can't be opened or a minor repair can't be performed.

Enhance Worker Safety and Reduce Noise Pollution With Broadband Alarms

Across the United States, noise pollution is not just an inconvenience — it is a safety concern and health hazard. A common noise in urban and some rural settings comes from backup alarms on heavy machinery. Today, technology offers alternatives to these alarms. One such technology replaces the traditional beeping noise with a sound that covers a broad band of frequencies. Workers on the job site can hear the alarm when danger is imminent, yet the sound is largely inaudible outside the work zone.

Check out all these stories at www.mswmag.com/ec/2013/August

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See what you're missing.

Baltimore Bureau of Water and Wastewater laborer Charles Lee loosens the chains from an old fire hydrant. (Photography by Matt Roth)

A

long one stretch of a key transmission main in the Baltimore Public Works water distribution system, the pipe

has ears.

A Pure Technologies Soundprint fiber-optic cable was installed five years ago in a 5.8-mile section of Baltimore's vital Southwest Transmission Main. The 54-inch pipe delivers water for not only a large part of the city, but to wholesale customers in several neighboring Maryland counties.

Rudolph Chow, the head of the Bureau of Water and Wastewater in the Baltimore Department of Public Works, says the fiber-optic system is used to listen for real-time breaks in the outer wires of the prestressed concrete cylinder pipe.

The Southwest Transmission Main is one of several key conduits in the DPW distribution system that were installed in the mid-1970s and constructed with troublesome Class IV PCCP pipes that have been prone to early failure due to breaks in the prestressed wires embedded in the outer layer of the pipe.

Chow, who joined DPW two years ago, says the bureau installed the acoustic fiber-optic cable in the main as a preventive measure to help protect an aging system that was beginning to experience problems with serious failures in its 1,583-mile network of water mains in the city. In addition to the city, the Bureau of Water and Wastewater also provides wholesale water to five counties in the region - Baltimore, Ann Arundel, Howard, Harford and Carroll — with systems totaling another 2,500 miles of water mains. Overall, the city supplies the water for 1.8 million people.

Baltimore officials use fiber optics to hear problems in water mains before they lead to catastrophic failures By Pete Litterski

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electro'scaninc. Call 800-975-6149 for a Dealer Near You Baltimore City Department of Public Works employees, from left, Nathaniel Copeland, site supervisor; Anthony Galloway, acting division chief of utility maintenence; Stanley Maith, heavy equipment operator; and Charles Lee, laborer.

Chow may be new to the job, but he is not new to the region or to the problems a water system can face if its Class IV PCCP mains begin to fail. Prior to taking the Baltimore job, Chow was at the Washington Suburban Sanitation Commission, which serves many of the suburban communities in the region between Baltimore and Washington, D.C. That system is also being pressed to maintain its Class IV PCCP.

Chow says that when he first joined DPW, his top priority was



PROFILE: Baltimore (Md.) Department of Public Works – Bureau of Water and Wastewater

SERVICE AREA:

City of Baltimore and five neighboring counties, 560 square miles

CUSTOMERS: 2 million

DISTRIBUTION SYSTEM: 1,583 miles in Baltimore; 2,500-plus in wholesale customers

BUREAU STAFFING: 2,000 funded positions

ANNUAL BUDGET:

\$350 million for operations & maintenance; \$700 million for capital improvements

WEBSITE:

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to assess the condition of the utility's assets and review the maintenance and replacement programs already in place. As with many systems along the eastern seaboard, one of the key factors in the condition of the Baltimore water mains is age. Nearly 900 miles in the system — more than half of the water mains — are more than 80 years old and water is still flowing through almost 55 miles of mains that were built prior to 1900.

Bigger concerns

Age is not the only concern as DPW employees continue to collect information on the condition of the system. Chow says there are 130 miles of PCCP pipes in the system, with 15 percent of those built with the Class IV steel rings. The steel was the strongest used in the manufacturing of PCCP lines, but the same factors that gave it high tensile strength also made it susceptible to brittleness when exposed to corrosive conditions, and it is therefore prone to breaking.

"These are vulnerable pipes," Chow says. "Nationally, there are many cities having problems with these Class IV pipes."

One of the key problems, he says, is that "once they get corroded, they can fail catastrophically without any notice." The sudden failures are different from many leaks in older, iron water mains which tend

PREPARING FOR THE WORST

When a transmission main fails, Rudolph Chow and the crews at Baltimore Public Works Bureau of Water and Wastewater don't want to be caught empty-handed if a section of the large pipes must be replaced.

That is why the new bureau chief wants to be sure repair kits are close at hand with the right-sized pipe and the necessary connectors or adapters that will let crews dig out a broken section and replace it with new pipe.

A key supplier of large water mains generally stocks just one section of each common water main size — 45, 54, 60, 72, 96 — on each coast so it can respond to emergency requests. But Chow doesn't want to get caught out in the cold if a main in his system fails the day after another utility has purchased the piece he needs.

Rather than assemble repair kits — one section of pipe and the necessary connectors or adapters — for each size of main in the system, Chow is working with the counties that are tied into the city's system. "We are actually in discussions to coordinate these repair kits among all the utilities," he says. "I may ultimately be responsible for the 96-inch pipe, but someone else can stock the 72-inch and someone else the 60. They all have PCCP in their systems, as well."

to fail slowly as corrosion advances. Those lines develop leaks that often make the problem readily visible long before a major failure occurs.

Compounding Baltimore's problems is the fact that most of the PCCP pipes are in large diameter transmission lines. A catastrophic failure in one of those lines can cause major damage in the immediate vicinity of the incident while causing water supply headaches over a large part of the utility's service area.

Gathering data

Because the PCCP was used in major transmission lines, Chow says it is often difficult to get a good idea of the pipes' conditions. To do a thorough visual inspection would require the city to shut down key sections of the transmission lines, disrupting supplies and stressing other sections of the network. Around the beginning of the 21st century, technology began to emerge that allowed utilities to assess the condition of *(continued)*





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pipes without disrupting service.

Pure Technologies experts monitor the information coming from the 5.8-mile acoustic fiber-optic line installed in the city's Southwest Transmission Main and alert DPW employees if they identify a pattern of wires snapping in a section of pipe.

"There are always going to be some breaks in the wire," Chow says. And a single broken wire is not necessarily a problem. The problem comes when there are a number of breaks in a confined area, a clear sign that the pipe is about to fail. "We can't rely on how many breaks might already be there, so we have to rely on frequency.

"They will give us notice ... they will tell us that in such and such a section there is something going on. When you have a wire break here and there, that's not alarming. But when you get wire breaking every week, and then maybe daily in one section, then you know you have to get in there and replace or repair one section at a time right now."

Chow hopes to get funding to install the fiber-optic cable system in all 130 miles of the PCCP in DPW's water system, even though only 15 percent use Class IV wiring. He says that is the best way to stay



Baltimore Bureau of Water and Wastewater department head Rudolph Chow.

ahead of the curve if sections are failing. Cost will be a big hurdle in reaching that goal. The cable itself may be the cheapest part of the system, costing \$10,000 to \$15,000 per mile installed. The biggest cost is the hardware needed to track the





Nathaniel Copeland goes through the proper steps to replace a residential fire hydrant, including preparation of the water main junction, placing the new hydrant and riser pipe, and mixing concrete to patch the area.

output of the cable. Chow puts that cost at \$350,000 per computer and says that one computer station can handle 10 miles of pipe, meaning the city would have to pay for 12 more units to cover the network. Finally, the city pays about \$2.50 per foot each year for around-the-clock monitoring by Pure Technologies technicians. The full 130 miles would add up to \$1.7 million, Chow says, "So this is not a cheap proposition. We don't have it currently in our budget."

New technology

In the meantime, however, the water system has added several new high tech devices to its arsenal of detection tools.

In March 2012, the utility deployed a PipeDiver system from Pure Technologies. "This tool looks like a 12"When you have a wire break here and there,
that's not alarming. But when you get wire breaking
every week, and then maybe daily in one section,
then you know you have to get in there and replace
or repair one section at a time right now."

Rudolph Chow

foot long, worm-like fishing lure," Chow says. It is inserted on the upstream end of a main to be inspected and is propelled by fins driven by the water flow. While in use, the tool generates an electromagnetic field that energizes the outer wires of the PCCP mains and takes "snapshots" of each section of pipe.

The information gleaned from the PipeDiver is studied to see if there are any problem spots in danger of imminent failure. The first deployment of the new tool pinpointed severe wire breakage in the Southwestern Transmission Main below some vacant railroad property. The damage was serious enough that DPW officials decided to take immediate action rather than wait until the "off season" in winter when the demand for water is much lower than in the summer months. DPW Director Alfred H. Foxx announced the plans for the shutdown on July 9, 2012, and asked the public to comply with water conservation measures while the main was out of service. The excavation began July 16 and by July 23 the new sections

"We don't look at just the 20 feet of main we are replacing. We generally want to physically walk through from valve to valve ... that can be several miles sometimes."

Rudolph Chow

of main were in place and the main was back in service. Chow says that 30 percent of the suspect pipe section had failed wires, calling the situation, "very dangerous on a large, high-pressure main."

Although the PipeDiver was used on the transmission main that already has the acoustic fiber-optic system, Chow says there is a need for both tools. While the AFO system listens in real time and can pinpoint areas where damage is occurring, it cannot detect where the main may have had damage before it was installed. The AFO serves as an early warning system while the PipeDiver can pinpoint actual damage and weak spots in the main.

DPW has also used the Sahara tethered acoustic inspection system from Pure Technologies to listen to pipes in its network. The Sahara can be used in pipes 6 inches and up and is used to detect leaks or gas pockets in a water service line.

Visual inspections

Whenever repairs force the city to shut down a major water transmission main, Chow says the crews take advantage of the downtime by doing a visual inspection of the portion that is dewatered. "We don't look at just the 20 feet of main we are replacing. We generally want to physically walk through from valve to valve ... that can be several miles sometimes.

"It's been my experience when you walk two miles or so, you will generally see other sections that need attention and it makes sense to do it while you are already down."

Even if more problems are found, the emphasis is on expediting repairs. "Most of the time when we go in there we want to get out as quickly as we can.

"We can reroute water, even if we shut down a transmission main, but that can be a problem if you do it very long. If I'm taking down a 72-inch main, I may have to route more water through one that is 45 or maybe 54. For system sustainability purposes, that puts more stress on the smaller transmission mains."

Other pipes

The focus on the problems with the larger PCCP mains in the Baltimore system doesn't mean that the water bureau has forgotten about the smaller, iron mains serving most of the communities in the service area. On the same day that work began on the Southwest Transmission Main in July 2012, a 123-year-old 20-inch iron main ruptured in downtown Baltimore, creating a huge sinkhole in a major street and damaging nearby buildings.

Chow says that more traditional inspection methods and careful record keeping will help the bureau track the worst of the problems in its aging system and help the department's engineers and managers set priorities as he tries to secure better funding to increase the spending for asset management and replacement.

Chow has launched a five-year plan to initiate and gradually ramp up a new asset management plan for the water distribution system. He said the focused program would be a first. "We never had the budget to do water main replacement before now."

Until recently, the city replaced or rehabilitated an average of five miles of pipe per year. Operating with an assumption that water mains should last for 100 years, Chow said the logical target is to replace 40 miles per year in the overall network his bureau works with, including 15 miles per year inside the city. "Right now, I don't have the budget for 40 miles per year, so we are starting with 20 miles and next year it would be 25, then 30, 35 and 40."

The five-year plan to get to 40 miles per year would cost \$300 million. "When I get to 40 miles per year, I need to see if we still need to ramp it up more or to hold steady," Chow says. "That will all depend on the condition of the system and the funding available then." +

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FOCUS: WATER

LEAK-TESTING LABORATORY

Henry County puts leak detection systems to the test and makes big strides in reducing water loss

By Erik Gunn

Henry County Water Authority GIS field technician Connie Nutt uses an Xmic system (Fluid Conservation Systems) to listen for leaks in a fire hydrant. (Photography by David Makkers) hen the water utility serving Henry County, Ga., was ready to replace its leak detection equip-

ready to replace its leak detection equipment a few years ago, the agency didn't just rely on word of mouth, a hunch, or a persuasive sales pitch

from the vendor. Instead, Brock Biles of the Henry County Water Authority road-tested three competing systems over a three-month period. The system that came out on top got the nod.

That sort of attention to detail exemplifies how the utility goes about its everyday business. By paying close attention to reducing leaks throughout the system, Henry County officials report they've saved more than a million dollars in lost revenue.

Leak detection has been the utility's most valuable tool in holding down costs, says Allen Rape, the GIS manager for the Henry County Water Authority. When the state imposed tough new water conservation measures a few years ago in the face of a drought, "we were already doing this," Rape says, referring to the leak detection program. "Every leak we find reduces our non-revenue water loss."

Growing concern

Located in north-central Georgia, Henry County is a mix of rural and suburban communities. The county seat, McDonough, is located in the center of the county about 35 miles south of Atlanta.

The water authority mainly serves county residents who don't live in incorporated municipalities. The 55,000 water service customers are connected by 1,400 miles of water line, about 60 percent of it ductile iron, 35 percent PVC, and the remaining 5 percent a mix of other *(continued)*

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The Henry County Water Authority team includes, from left, GIS field technicians Gary May, Connie Nutt and David Berkowitz, lead GIS field technician Brock Biles, and GIS field technicians Lee Mooney and Brad Rowland.

materials. They're served by two treatment plants and five reservoirs.

Henry County set up its leakdetection unit in 2007. With the age of some of the pipes, water loss from leaks had become a growing concern.

In 2010, Biles, who had been an inspector for the utility, moved over to run the leak-detection program. He made the move just as the authority was getting ready to replace its existing leak-detection equipment.

"We had to purchase all new equipment," Biles says. He decided to choose the new supplier scientifically.

Systematic testing

Biles contacted several vendors. Three sent sample products, including the maker of the system the county was getting ready to replace.

To try them out, Biles took over an empty subdivision. It had been prepared for new homes, and the authority had already extended water and sewer service there. But with the national real estate bust, nothing had been built and the utilities had gone unused.

It was a perfect opportunity. "I made my own test site," he says.

A leaking stretch of service line that was designated to be replaced



Gary May deploys Soundsens i correlating loggers to test for leaks in PVC pipe used on residential water valves (HWM-Water).

elsewhere in the system came in handy. "We took it out of the field and installed it in the subdivision so we could use it for testing," Biles explains.

Then, day after day, they ran leakdetection tests, comparing the three systems as they ran side by side.

They used other pieces of pipe as well, exploring the results with various materials. "I even put a PVC line in," Biles says.

PROFILE: Henry County (Ga.) Water Authority

POPULATION SERVED: 55,000 customers (est.)

SERVICE AREA:

Unincorporated portions of Henry County, Ga., along with portions of some municipalities

WATER VOLUME:

INFRASTRUCTURE:

- 1,400 miles of water mains
- Two water treatment plants; combined storage capacity of 29.5 million gallons in nine elevated tanks, four ground water tanks, plus clear wells at treatment plants
- Five reservoirs with a combined water surface area of 3,138 acres and combined capacity of 18 billion gallons

ANNUAL OPERATING REVENUE:

\$33.3 million (2013) water usage only, excluding connection fees and other charges)

EMPLOYEES:

- connection, wastewater treatment, repairs and maintenance, administrative, engineering and information technology): 216

WEB SITE:

Being able to use "real" leaks that had developed through the natural course of operation of the system was important. Holes made deliberately in clean pipe just to test for leaks didn't sound the same as a true hole, he says.

Altogether the testing team used six different leaks and sent three different volumes of water through

each leaky test pipe for each system being tested. "The higher the volume, the louder the leak noise is," Biles explains.

Strengths and weaknesses

The tested systems were all variations on logger-based systems in which sensors were deployed across the system to record leak data at des-(continued)

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SPREADING THE WORD

The Henry County Water Authority's scrutiny and experience in leak detection is beginning to have ripple effects, according to authority executives.

The authority has had several different municipalities from Georgia come in to learn about the their leak detection program, says Brock Biles, who is directly in charge of that program. Visiting personnel will spend the whole day learning about Henry County's use of the technology.

"We've assisted a couple of neighboring counties and cities to help them find leaks in their system," Biles says. "They may not have full leak detection programs," and welcome the assistance.

"We do it for free," he continues. "It is for the good of the industry and to help fellow water utilities facing similar challenges. We feel like if we can share what we learn, they may actually call us back" to exchange their own tips and suggestions.

ignated times, usually overnight. "We put them a maximum of 500 feet apart," Biles says, because when they were farther apart, sensors would sometimes miss the leak they were supposed to detect.

"I was really able to see how to get the optimal performance from each logger," Biles says. The experiment also allowed the team to put each product through the paces on all the different types of pipe used on the Henry County system to analyze the strengths and weaknesses of each.

When the testing was finished, Biles says, the authority selected the Permalog Plus system from Fluid Conservation Systems Inc., based in Milford, Ohio. Coincidentally, the system was replacing a previous FCS product.

Daily checks

The authority's procedure for leak testing has stayed pretty much the same since the program began in 2007. Two employees go out daily and deploy 120 loggers in a prescribed segment of the water line system.

The loggers are programmed to turn on at 2 a.m., when there's unlikely to be much actual use of the system, which could confound the readings.

If the loggers detect a leak, they turn back on an hour later to verify it; otherwise they'll shut back off and stay shut off. The next day, the workers retrieve the loggers, shifting them to the next segment of the line.

It takes about a year and a half to get through the entire system this way. "We've swept the county three

times already since 2007," says Biles. "We're in our fourth cycle now."

The loggers are used strictly for ductile iron pipe. Three other employees use ground microphones to systematically work their way through the system's PVC lines as well as checking every joint, fixture and fire hydrant and the small amount of pipe made of other materials.

That part of the procedure is new. When Biles was first conducting tests on the three alternative systems he realized that PVC lines weren't getting the same attention. "This cycle [of inspections] is the first time we are actually doing that," he says.

"When you pick the logger out of the ground, you swipe it to the handheld devices. Every afternoon the crew comes in, they dock the handheld, it uploads to the server and it updates our maps and records."

Brock Biles

For those and related tasks, the agency relies on a mix of equipment, including the Xmic, from Fluid Conservation Systems, as well as the Tri-Corr and Soundsens i correlators.

Staying connected

From the very beginning of the





ABOVE: Lee Mooney uses a TriCorr Touch correlator to listen for leaks in a water line. RIGHT: Connie Nutt retrieves a Permalog Plus logger from a water line. Both products are from Fluid Conservation Systems.

inspection routine six years ago, with every logger deployment, the utility mapped every stretch of pipe inspected and recorded the data on its condition and any repairs that have been made. "We can pull up at any time information about what the results were," Biles says. In addition, the information that the logger collects when it is in use including when it was deployed and when it was retrieved, can help the







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authority track the workflow process.

The maps are updated by handheld readers that logger crew members carry.

"When you pick the logger out of the ground, you swipe it to the handheld devices," Biles explains. The data is uploaded wirelessly to

"We've swept the county three times already since 2007. We're in our fourth cycle now."

Brock Biles

the reader. "Every afternoon the crew comes in, they dock the handheld, it uploads to the server and it updates our maps and records."

When a leak is detected, the inspectors, who carry laptops in their trucks, enter information in the laptop's database regarding the location and the severity of the problem. They measure how much water is coming out from the leaky pipe, take pictures of each leak and attach them in the database.

If repairs are urgently needed, the detection team contacts the authority's operations manager, who in turn sends a repair crew to the scene.

And as the inspection program over time has helped in the targeting of repairs to damaged pipe, the number of leaks has begun to decrease. "The lower the number of leaks you have, you don't have to say, 'We have to go expand our treatment plant,'" Biles says.

The empty subdivision remains handy now, only instead of a testing lab it's a teaching environment: "When new employees come in, I use it to train them on how to use the equipment," he says.

Now that the housing market has begun to improve, he's not sure how long the unoccupied neighborhood will be available.

"One day I'm going to lose it," Biles says, "because they're going to build houses on it."

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PEREORMING UNDER PRESSURE

An EPA consent decree with DeKalb County, Ga., has made accelerated infrastructure mapping a critical goal

By Peter Kenter

at DeKalb County, Ga., which is working to complete a detailed Geo

working to complete a detailed Geographic Information System map of its expansive sewer system, complete with Global Positioning Satellite coordinates, in just two years.

The county entered into a consent decree with the Environmental Protection Agency in December 2011, in which the EPA ordered the county to upgrade its infrastructure and reduce its sanitary sewer overflows. Part of that decree instructed the county to accelerate an infrastructure-mapping program that fully assesses the county's sewer assets.

"Our sewer collection system was mostly built in the '60s, '70s and '80s, so it's now 25 to 50 years old on average," says Ted Rhinehart, former deputy chief operating officer with DeKalb County's Infrastructure Group of Departments. "While we find most of the pipes are structurally sound, there is need for rehabilitation and repair to extend their life and reliability."

The pipe materials are about half PVC, about one-fourth reinforced concrete, and about onefourth ductile and cast iron.

Capacity the major issue

The primary cause of SSOs isn't the condition of the infrastructure itself — it's the system's reduced capacity. "We have very few I&I or structural issues," says Rhinehart. "Most of the SSOs — about 75 percent are related to build-ups of fats, oils, and grease and deposits of debris. The completion of a more precise GIS map of the system will create a model that will validate the fact that any capacity issues have been eliminated. Most of the solution to reducing SSOs will be regular system cleaning, public education on FOG and prevention. But the map will also provide us with an asset man-

OPPOSITE PAGE: From left, Jonathan Reeves and Tony Dawson of Reeves and Associates run a RIDGID pole camera inside a manhole while Darren Eastall, DeKalb County Watershed Management supervising engineer, looks on. (Photography by Kaylinn Gilstrap)

agement tool for the prioritized sewer cleaning, maintenance and repair programs to follow."

DeKalb County lies largely east of Atlanta, although it includes about 10 percent of the city. Its DWM is responsible for water, sanitary sewers and wastewater treatment.

The county has worked to expand and formalize assessment and rehabilitation of the wastewater collection system since 2006, when it experienced a record number of SSOs. The person in charge of the current accelerated mapping effort for the county is Darren Eastall, engineering supervisor and member of the GIS/GPS/data management staff with the DWM.

"The EPA consent decree concentrated on developing both the sewer mapping program and a capacity, management, operation and maintenance program," says Eastall. "However, the mapping program will inform the CMOM program.

The GIS sewer mapping is the foundation for so many of the consent decree programs that it was explicitly pushed to the top of our 'to do' list by the EPA. It's put a lot of pressure on our department to perform."

Manholes pass the test

The county has had GIS capability since about 2002. Before the consent decree it had completed GIS mapping of part of the system's 2,600 miles of sewer lines, some sewer assessment and detailed mapping of forcemains and lift stations. It had assessed the condition of more than half of its 55,000 manholes and found that more than 94 percent had no structural defects and only a small number of the remaining 6 percent required significant rehabilitation.

"With this program we are actually locating and surveying the sewer lines, checking the connectivity, design capacity and the pipe invert eleva-

BELOW: Jonathan Reeves of Reeves and Associates enters manhole data on an iPad mini using Fulcrum field data collection software (Spatial Networks). RIGHT: This data is then incorporated into the DeKalb County infrastructure map powered by Esri software.



tions, which were never captured in the CAD effort," says Eastall. "The CAD files were based on 'as-builts' and plans, but there wasn't always a confirmation that the lines were located exactly where we believed them to be. While we knew some of the GIS information, the information was kept in a separate database - it wasn't yet a true GIS system."

The DWM refined the scope of its accelerated mapping program in early 2012. Because it was clear that capacity, not infrastructure degradation, was the chief contributor to SSOs, some of the detailed assessment was postponed.

"We made it purely a mapping and capacity exercise," says Eastall. "That's not to say that we don't ask for and acknowledge any obvious problems that might be reported. If something is wrong, we'll deal with it, but it isn't the prime driver for the program at this point. We want survey grade maps, including GPS coordinates and general conditions of each manhole, coordinates of pipe sites, grades, pipe inverts and digital photos of manholes and any other surface features."



Contracting out

In order to complete the redefined \$15 million mapping program by December 2014, the DWM is contracting out the survey work. The county had already contracted the Atlanta branch of the engineering firm of Brown and Caldwell to complete the preliminary

assessment of the

PROFILE: **DeKalb** County (Ga.) Department of Watershed Management

INFRASTRUCTURE: 2,600 miles of sewer lines, 5,000 miles of water mains,

ANNUAL BUDGET (2013): \$265 million

ASSOCIATIONS: American Water Works Association, Association of Metropolitan Water Agencies, Water Environment Federation, National Association of Clean Water Agencies

WEBSITE:

THE ABCS OF SOPS

Producing a detailed system-wide map of a 2,600-mile sewer system in less than two years is a complex undertaking. With a tight time frame to complete the mapping project, the Department of Watershed Management at DeKalb County, Ga., invested in the creation of a detailed Standard Operating Procedures (SOP) manual for all staff and contractors working on the project.

The SOP includes instructions on the sewer mapping survey process, updating the sanitary sewer GIS Inventory, using the sanitary sewer GIS Inventory and updating GIS Software.

"We employed a consultant to help us produce the detailed document," says Darren Eastall, engineering supervisor with the GIS/ GPS/data management staff. "It required a small initial investment but helps ensure we receive quality data. It also keeps everybody management, internal staff and external contractors and consultants - on the same page."



"The GIS data is now part of their everyday toolkit and we're being asked for more and more datasets, different types of data analysis, more tools and more layers of information on the GIS map."



Manholes are mapped on an iPad mini.

system in an initial five-year agreement that expired in 2012.

The current accelerated program has been divided among three contractors working simultaneously on one-year contracts. Brown and Caldwell has been retained, as has Arcadis US Inc. and Woolpert Inc. The selection process for the contractors was designed to ensure that the county received the best value for its money, despite the imminent demand for outside services.

"We went through a request for proposal process and had the proposals assessed by a selection committee that included our purchasing and contracting staff," says Eastall.

Darren Eastall

"We started with seven proposals, interviewed the top five, and then contracted with the top three candidates."

Eastall says effective communication is the key to working with multiple contractors on a project of this scope.

"It's essential to convey to them exactly what you expect and the form that the data they collect is going to take," he says. "You also need to be available to listen to and act on their feedback."

Each contractor is also provided with a detailed set of standard operating procedures to complete its tasks (see sidebar).

Each contractor is assigned to a sewer shed, divided into areas containing an approximately equal number of manholes. Contractors are provided with the original CAD surveys, then sent out into the field. Work is generally structured to complete a particular geographic boundary. About a dozen members of the DWM are available to the survey teams and bring real-world experience with DeKalb's infrastructure to the game.

"They're not necessarily embedded with the contractor, but they're on call to assist when necessary," says Eastall. "That expertise with the system is essential and irreplaceable. They may be needed to help find a buried manhole or to act as a mediator when a citizen demands to know what the survey team is doing near their property."

Contractors also send in reports of badly graded topography, or manholes with capacity obviously affected by grease.

"We have an in-house operations department that looks after the maintenance and repair of our pipes, so if there's an immediate need for maintenance, they handle it," Eastall says. "This additional information is already helping us to develop strategies for the next phase of the program."

Selecting the software

The software tools being used to complete the project include Arc-GIS by Esri for mapping, and InfoNet and InfoWorks databases by Innovyze for system inventory and modeling. The project also employs the CMMS maintenance software package by Oracle and Microsoft Access database software.

At the end of each month, the data collected by contractors is submitted and incorporated into the From left, Jonathan Reeves, field crew chief with Reeves and Associates; Darren Eastall, DeKalb County Watershed Management's supervising engineer, and Tony Dawson; professional engineer from Reeves and Associates.

overall GIS map. In some cases, the GIS data differs markedly from the original as-built data.

GIS database finding champions

The GIS database is available to any employee with access to the Internet or county Intranet and is already finding champions.

"We immediately began to see that the system was being used by people from our operations group, our customer service group and our dispatch department," says Eastall. "The GIS data is now part of their everyday tool kit and we're being asked for more and more datasets, different types of data analysis, more tools and more layers of information on the GIS map."

As the DWM works toward its 2014 completion goal, its GIS map continues to expand in functionality and detail, providing immediate benefits.

"What's great about this is that the data arrives in a form that we can incorporate and use almost immediately," says Eastall. "The GIS map is literally expanding before our eyes." \blacklozenge

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USE YOUR TIME WISELY

Establishing a successful CCTV inspection program takes careful planning, attention to detail and plenty of hard work

By Jim Aanderud

ipeline inspection programs vary from agency to agency. Some are very dynamic and achieve remarkable productivity, while others lag. By understanding the characteristics that make up a successful CCTV inspection program, you can identify critical points that can serve as a guide for your program.

Let's begin by establishing the definition of a successful CCTV inspection program. It is first and foremost based on the quality of the recorded videos and on the accuracy and usefulness of the information gathered. Since critical and costly decisions are based on these factors, it is imperative that the video and data be of the highest possible standard.

Another critical component of a successful CCTV inspection program is the quantity of video inspections produced within a stated period of time. This measurement is most commonly defined by the total number of feet inspected in a day, month or year. It is generally referred to as production.

Most agencies justified the purchase of their CCTV inspection unit(s) based upon projected production. The outlay of capital was deemed reasonable because of the anticipated footage that crews would be able to inspect. Most agencies warranted the purchase by setting timetables to inspect their entire sewer system.

The outcomes of these decisions aren't usually realized until much later. While most inspection programs reach their stated goals and achieve success, many struggle and eventually fail. For those who fall short, the justification to purchase a CCTV inspection van was flawed. Testaments to this fact are the numerous inspection vehicles that never met their goals and now sit idle in agency yards. Most of these vehicles operated for less than three years before being put out to pasture, and most all of them failed because of a lack of production.

Why do CCTV programs fail?

The number one reason CCTV inspection programs fail is because an unqualified individual is selected as the CCTV inspection operator. The skills required to succeed as an operator are very important and must be thoroughly evaluated during the hiring process. Finding an individual with strong computer and mechanical ability is key. Leadership and organizational skills are indispensible, as is dedication and a can-do attitude. Anyone short of an ideal candidate will doom the inspection program from the onset.

Inspection programs also fail due to a lack of training. Operators must be given the tools to succeed. A few days of factory training and a few days of NASSCO PACP training may not be sufficient. Having a qualified trainer to thoroughly prepare a pipeline inspection operator will increase the chances of success.

Ultimately, pipeline inspection programs are judged by the quantity of feet they are able to inspect. If an agency consistently fails to meet its inspection goals, it is only a matter of time before management deems it a failure and abandons the program altogether. In most cases, a contractor will be brought in to complete the program.





ABOVE: Jake Zeiger, CCTV operator, prepares to lower an inspection camera into a manhole. LEFT: Zeiger and assistant Jordan Slicker work in tandem to maximize their daily inspection footage.

How can we ensure high production levels?

CCTV inspection operators will not succeed without good time management skills. Each day must be a process of planning and exercising conscious control over the amount of time spent on specific activities in an effort to increase effectiveness, efficiency and productivity.

I once had the opportunity to observe a low production crew. Even though they arrived at work at 7 a.m., the first pipeline wasn't inspected until well after 10 a.m. To begin with, there was absolutely no hurry to leave the yard. Once mobilized, there was a rendezvous at the local

donut shop that lasted much longer than necessary. The crew finally headed to the job site, arriving at 9 a.m. After taking their time to set up traffic control, there was the realization that the manhole hook was missing, so they returned to the yard to get one. That morning, two sections of pipe were inspected. The crew then went on to exceed their allotted time for lunch and wound up with the same dismal numbers for the afternoon. With a miserable amount of pipeline inspected that day, it was clear that this inspection program was doomed.

Success in any job comes from a sense of urgency in performing

the work. This is certainly the case in the field of pipeline inspection. An operator must constantly push ahead in an effort to accomplish as much as possible. Tasks that can be done right away should never be left for later. Ultimately, an effort must be made to fit as much as possible into each moment of the day.

From the moment you clock in to the moment you clock out, you are being paid to perform your work. As a pipeline inspection operator, you are expected to spend as much time as possible inspecting pipe. Any time that is directed elsewhere is unproductive.

Time is often deliberately wasted in order to minimize actual work. The term I like to use for someone who intentionally milks the clock is tion, you must reduce the time spent in between inspections. Whether you are working alone or with a crew, the more effective system you have for getting from manhole to manhole, the higher the production rate will be.

When a survey is completed and the crawler has returned to the access manhole, it must be retrieved, washed down and placed into the van as quickly as possible. At the next location, manhole lid removal and crawler insertion must be done cautiously but urgently. Every action must be performed as expediently as possible in order to maximize inspection time.

Multi-tasking is a very useful way of capitalizing on your time. By performing more than one task

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a "time thief." As harsh as this may sound, this is exactly what is happening when an employee is avoiding work for which he is being paid.

Using time productively starts at the beginning of each day and must be carried through to the last minute. We must ensure that nonproductivity is held to an absolute minimum. It begins with getting out to the job site as expediently as possible. It means planning ahead to ensure everything you need is on the vehicle. It means carrying out your plan in the most efficient manner possible. It means leaving nothing to chance. The bottom line is you must work as methodically as possible in order to maximize production.

You must eliminate non-productive actions. Aimless chatter, private phone calls, texting and Internet surfing are all examples of lost opportunities. Anytime work comes to a standstill, it takes away from your production potential. Operating a CCTV inspection unit is not physically demanding, so there is absolutely no reason to stop and rest or sit with nothing going on.

Time between inspections

You can only be productive when the camera is in the line recording video. In order to maximize producat a time, production can be accelerated significantly. For example, while the crawler is being brought back to the access manhole, the next survey can be identified and set up on the computer. This will ensure that the next inspection begins the moment the crawler hits the bottom of the next manhole.

If not managed properly, traffic control can also affect a crew's productivity. When support staff is available, crew members should move ahead and place traffic control devices ahead of time. This will allow the inspection van to move right in, drop the camera and begin recording immediately. When long continuous stretches of pipeline are encountered, laying out the traffic control devices over multiple setups can help increase productivity.

Your time in the field is limited, so managing it effectively is the key to maximizing the number of pipeline inspections you perform. Achieving high production levels will ensure that your inspection programs are successful and that your jobs remain secure for many years to come. +

About the Author

Jim Aanderud is owner of Innerline Engineering, a video pipeline inspection company based in Corona, Calif.

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Expo Spotlight

CONTROL IN THE CORNERS

RapidView IBAK rolls out POLARIS lateral inspection camera at 2013 Expo

By Craig Mandli

an-and-tilt inspection cameras are a staple for pipe inspections in the sanitary, storm and water system industry. However, typical systems are sometimes limited when inspecting bends and junctions in the pipeline. To combat that issue, **RapidView IBAK** rolled out their new **POLARIS** lateral camera at the 2013 Pumper & Cleaner Environmental Expo International in Indianapolis, Ind.

Designed for inspecting smaller-diameter pipes, this push camera is mounted on a pivoting arm that allows the operator to choose the direction when traversing around bends and junctions which were previously difficult to inspect.

"We wanted to design a lateral navigating camera system that had a completely unobstructed view," says Matt Sutton, RapidView IBAK's vice president of sales and marketing. "Previous lateral cameras, including ours, had a 'steering stick' that was visible in the video picture that prevented the camera system from providing a full 180-degree pan range.





The removal of this stick allows users to have a full pan-and-tilt range while still allowing the ability to navigate bends or joints in

the pipeline." The company publicly displayed the camera system for the first time at the 2013 Expo, and Sutton says they were pleased with the response from the crowd. "We received considerable interest. No one had seen anything like it, and it provides operators with an enhanced view and navigating capabilities," he says. "We took orders at the show "We received considerable interest. No one had seen anything like it, and it provides operators with an enhanced view and

navigating capabilities."

Matt Sutton

and first deliveries went out in the early summer."

An onboard telemetry system tracks the camera's viewing angle and rotation to determine the distance between two points on the pipe wall. This allows users to measure pipe defects and the diameter of objects without bulky attachments or analysis programs. "The flexibility gained from the full pan range allowed us to install that onboard laser measurement device which determines those defects and deformations inside the pipeline," Sutton says.

Other features include upright picture control, a wide-angle view (120 degrees), low light sensitivity that allows it to inspect larger pipelines, an FOV of +/- 150 degrees, and bright LED lighting. It is designed for utilization in push applications, and can be laterally launched from the company's LISY launch system.

"The POLARIS is the evolution of our ORION-L camera, our first lateral navigating camera on the market," says Sutton. "We believe it will be embraced by our lateral launch users primarily, but it also works exceedingly well for industrial push applications where other cameras may not be able to traverse the pipe."

Sutton believes the Expo was the marquee event to roll out the new technology. "We consider this design revolutionary, and many we talked to at the Expo agreed," he says. "This design takes a traditional pan-and-tilt camera and adds versatility that no one has seen before. We'll absolutely be back with it at next year's Expo." 800/656-4225; www.rapidview.com. ◆



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Dear Prototek: ⁶⁶ Just wanted to let you know I am well pleased with my recent equipment purchase from Prototek. I went out today and located 4 empty conduits (2 - 2'' and 2 - 3'') for our Library District that nobody else had been able to locate. Using the 3/16" rodder, the FM-10, drop head and flex leader, we pushed 180 feet through both the 2" and 3" conduits and about 100 feet through the other 2" and 3". We could have pushed the rig further but were at the ends of the conduits. I had tried my ground penetrating radar, but due to site conditions (lots of rebar & obstructions) I could not be sure of the locations. I had also tried my larger sonde from another company but it would not make it around the sweeps in the conduits. Thanks for the excellent equipment."

David H. Denman, P.S.M. Eng, Denman & Associates, Inc. Gainesville, Florida

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DEFUSE DIFFICULT EMPLOYEES

Reining in the drama queens, complainers, bullies and slackers who seem to inhabit every workplace requires the proper approach

By Ken Wysocky

omewhere along the line, managers and employees inevitably find themselves working alongside what's charitably known as a "difficult" person. You know the drill: that guy who compulsively disses colleagues behind their backs ... the chronic complainer who sucks up co-workers' time the way a vacuum truck gobbles up sewer sludge ... the slacker who doesn't pull his or her weight and often misses project deadlines ... the confrontational bully who steamrolls over more submissive employees.

At best, they become corrosive white noise in the workplace. At worst, they cripple productivity, contribute to employee turnover and deflate workplace morale — especially if managers fail to take action, which happens more often than not.

"At some point, most managers practice what I call psychic management," says Marie G. McIntyre, a nationally known management consultant, employee coach (www.your officecoach.com) and the author of Secrets to Winning at Office Politics: How to Achieve Your Goals and Increase Your Influence at Work. "They think a lot about an employee's performance problem, but don't take the next step and talk to them about it ... and eventually, they get pretty worked up about it. And when they finally confront it, the conversation tends to not go very well.

"Managers need to learn how to develop a plan for presenting the problem to an employee in a way that actually makes a difference helps the person understand what the problem is," she continues. "We assume they know they're a problem, but they usually don't. So it's important for managers to issue an invitation to change. Psychic management is not going to do it."

In some instances, managers don't take action because, though it may sound counter-intuitive, challenging employees can also be top performers. As an example, McIntyre points to an employee she supervised years ago who was a very good corporate trainer that consistently received great evaluations from workshop attendees. But the employee also took up an inordinate amount of McIntyre's and colleagues' work time by sitting down and complaining at length about personal issues.

So what's a beleaguered manager to do? McIntyre recommends giving behavioral coaching a try, which requires a specific set of strategic actions aimed at changing the challenging employee's negative behavior, and creating an environment that helps them do so. Here's what she suggests:

1. Make the employee aware of the problem. In a non-confrontational, face-to-face meeting, the manager must—without scolding—point out the offensive behavior, keeping in mind that the employee might be blissfully unaware of it. "These challenging employees can get so caught up in their emotions that they truly don't see reality," she explains. "Most effective people can choose their behavior ... they decide how to act, as opposed to being driven strictly by emotions, such as anger or anxiety. If you want to act that way at home, that's fine. But it's not going to work for you in the office."

2. Specifically identify the problem. Too often, managers — especially those averse to confrontations — undermine their own efforts by talking about the employee's problem in what McIntyre calls fuzzy terms: You have a bad attitude. You We invite readers to offer ideas for this regular column, designed to help municipal and utility managers deal with day-today 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.

tioned scenario, McIntyre says she suggested going out to lunch once a week, which gave the employee a time and place to vent where it didn't interfere with work. "It worked fine with her," she says. "I used motivational levers — figured out what motivated her behavior. She wanted interaction and attention. We structured it so she got her attention —

"Managers need to learn how to develop a plan for presenting the problem to an employee in a way that actually makes a difference — helps the person understand what the problem is."

Marie G. McIntyre

don't communicate well. You don't show enough initiative. These comments center more on the employee's personality than on the specific behavior that requires modification.

Instead, managers should specifically identify the offending behavior, as well as describe why the behavior is a problem; if the manager can somehow quantify the negative ramifications of the employee's behavior, all the better. For instance, instead of McIntyre just telling her chronic-complainer employee that she talks too much, specify how her impromptu, gabfest interruptions prevent other employees from getting their work done and derail projects.

Managers should also explain how the employee's behavior could be preventing them from reaching a professional goal, such as a promotion.

3. Propose a specific substitute behavior. To resolve the above-men-

at lunch on Fridays. This gave me a way to manage her out of my office."

4. Follow-up with feedback and encouragement. Changing a deeply entrenched behavior can take a long time. So managers need to frequently praise an employee's efforts and encourage them to keep working on implementing their substitute behavior.

While going through this process, it helps immensely if managers possess a basic understanding of human behavior; that is, realize that all behavior is goal directed. This is true even if the employee's inexplicable behavior hurts them more than helps. Some employees act like children and sulk, then refuse to say why when asked; managers can counter that by no longer asking what's bothering them. In other words, just like parents who must deal with difficult children, don't reward the behavior you don't want, McIntyre warns.

"In most cases, difficult employees are trying to meet an emotional goal, not a rational goal," McIntyre points out. As an example, she cites a client who received a poor performance review because she insisted on taking vacation time without notifying her manager.

"The obvious question was why didn't she just ask her manager first?" McIntyre notes. "She said she didn't understand why she had to, because it's her time to take off. She was in a power struggle with her boss, and her emotional goal was to feel in control and send a message to her boss.

"So we talked about how emotional goals get in the way of rational goals that would result in a better performance review — and possibly a new job," she adds. "Employees have to keep in mind that most of the time, if they go to war with their boss, they're going to lose."

Of course, some difficult employees are impossible to rehabilitate. In those instances, termination is the only solution.

"A toxic employee — one whose personal agenda runs counter to the goals of the group — will suck the energy out of your team," McIntyre says. "They like to cause trouble, spread rumors and so on ... and take up so much time and energy that a cost/benefit analysis definitely ends up on the cost side."

Absent that, however, managers should develop a game plan and prepare to coach 'em up. Psychic management alone just won't get the job done. \blacklozenge





PIPELINE INSPECTION, SURVEYING AND MAPPING

By Craig Mandli

Inspection Camera Systems/Vehicles

Side-scanning camera

The CUES Digital Universal Camera (DUC) is

a high resolution, digital CCTV, side-scanning camera designed for rapid and detailed condition assessment of wastewater systems. It can inspect and assess 5,000 feet or more per day, producing a high-resolution digital video scan of internal pipe conditions in 6- to 60-inch pipe, and a flat unfolded



view of the pipe to facilitate rapid assignment of observations. An expanded flat unfolded view of the pipe is provided for measurement purposes. It has no moving parts and is driven through the pipe without the need to stop, pan or tilt. The unit can be driven on cruise control to a remote manhole or through multiple manholes. **800/327-7791; www. cuesinc.com.**

Pipe inspection camera

The **EasyCAM E3200** was designed from a plumber's perspective, using easily replaceable modular components. When repairs are needed, the owner can easily do them, as no special tools are needed. It includes a lightweight titanium color camera head, 200 feet of HYTREL abrasion-resistant pushrod with molded waterproof connectors, 512 Hz transmitter, onboard 8-inch



daylight readable monitor, powder-coated aircraft aluminum frame, RCA video jack for laptop or DVR use, safe 12-volt operation, heavy-duty wheels and a two-year warranty. **239/260-2056; www.easycamllc.com.**

Pan/tilt push camera

The camera head of the **VeriSight Pro 360** from **Envirosight** remotely pans and tilts to give an operator maximum maneuverability when inspecting drain lines. A joystick on the control unit rotates the camera indefinitely in either direction and tilts it ± 135 degrees. It makes it easy to view, record and document pipe condition. Its digital interface displays real-time inspection footage on an 8-inch LCD, records up to 90 hours of inspection video to internal memory, and allows an operator to enter obser-



vation data for upload directly to WinCan. An intuitive, customizable interface lets operators zoom 3X on live or recorded video, capture still images, configure the 16-page text writer, browse thumbnail galleries, and select among several available languages. It comes in standard lengths of 200 and 330 feet. Its anodized aluminum camera head with high-sensitivity imager and shadowless LED lighting inspects pipes up to 9 inches. An integral tri-band sonde transmits at 33 kHz, 512 Hz or 640 Hz. The entire system runs off mains power, vehicle power, or an internal recharge-able 6-hour Lithium-ion battery. **866/936-8476; www.envirosight.com**.

Municipal inspection system

The **MY400** municipal inspection system from **MyTana Mfg. Company** is ideal for the small- to medium-sized municipalities responsible for operating, documenting and maintaining sanitary sewer systems. Included is a color selfleveling camera, which has 36 bright LEDs for illuminating larger sewer lines, and a built-in 512



Hz transmitter for locating. The control system incorporates a touch screen with drop and drag icons to easily identify common problems. The laptop-based system also allows for easy recording, uploading and backup of inspection activities. Four hundred feet of pushrod is adequate for inspections between manholes. The locator-receiver pinpoints problems before digging sewer lines. The sonde transmitter provides a strong signal for locating problems in deeper municipal sewer systems. **800/328-8170; www.mytana.com.**

Portable crawler inspection system

The **P350 Flexitrax** portable crawler inspection system from **Pearpoint/SPX** is a modular system that features interchangeable components. Options include a manual or powered drum, three interchangeable cameras, and a wide range of wheels, cable length and crawler size. The digital platform allows users to transfer survey data from a compact flash card to a PC or laptop via USB 2.0. The included FlexiSight Windowsbased software allows users to edit video and convert reports to Microsoft Word. It features an integrated report writer to create on-site inspection reports that



contain company and client details, observations, comments and selected photos. Reports are generated in HTML format and are compatible with IE 6 or above. It is small enough to fit in the trunk of a car, and can be van- or truck-mounted and wheeled on site using the ergonomic barrow design. **800/688-8094; www.radiodetection.com.**

Pan and tilt push camera

The **Pan n' Tilt Push Camera** from **Ratech Electronics** can be used for pipes and drains as small as

4 inches in diameter. Originally used as a mainline camera, it has been redesigned to fit into small lateral pipes. It rotates fully 360 degrees and 210 degrees up and down, allowing users to view the pipe condition easily and in more detail. An optional steerable gooseneck assists the camera in the direction you want it to go. Combining it with a control unit gives recording capability using SD/USB drives and allows MPEG video capture and JPG image capture. Also included is a 512 Hz sonde, an onscreen text display overlay system, electronic distance counter, time, date and eight pages of memory. Gel-Rod cable is available in 200 to 400 feet. **800/461-9200; www.ratech-electronics.com**.

Laser pipe profiling camera

The **KS135 Scan** from **Rausch Electronics USA** features two laser diodes integrated into a mainline camera head that projects lasers onto the pipe wall. It is designed to perform three tasks in one system: CCTV inspection, crack



measurement, and laser profiling. As it travels through the pipeline, it performs traditional CCTV inspection while taking accurate joint and crack measurements using integrated laser diodes. On the return trip to the manhole, the rotating camera head analyzes the pipe profile. All data is generated on site using the POSM software. It can be deployed in pipes 8 to 48 inches in diameter. **717/709-1005; www.rauschusa.com**.

Mainline and lateral inspection system

The GEN2 Zoom from RS Tech-

nical Services allows operators to



perform inspections in 6- to 24-inch pipelines from a single integrated unit. Locatable via a built-in 512 Hz sonde, the system features a pan and tilt mainline camera and an auto upright lateral camera. A launch camera actuator allows for easy insertion into 90-degree laterals and the 90W motor produces pushing force for lateral inspections up to 100 feet from the mainline. The six-wheel drive tractor features three forward speeds, reverse and freewheel with speeds up to 70 fpm. Also included is a cable reel with 600 feet of cable (100 feet of push cable and 500 feet of 3/16-inch-diameter armored Sincon cable). **800/767-1974; www.rstechserv.com.**

Lightweight inspection camera

The **Sparvision 200** pipe inspection camera from **Spartan Tool** is lightweight and easy to maneuver, and is outfitted with iPad technology. Features include telestration to actively draw on the screen, 200 feet of ultra-slick pushrod, and a color self-leveling camera head that simplifies diagnosis. It can take instant snapshots at any time, and has a full onscreen QWERTY keyboard and a standard 512 Hz locating beacon. **800/435-3866; www.spartantool.com**.



Versatile inspection camera

The **VIS 340** from **Wohler USA** is a versatile inspection camera set that comes in a self-contained carrying case. It can analyze defects in water pipes and inspect flue-gas lines, chimneys, air-conditioning lines, heating lines, ducts, welding seams, gaskets, manholes and more. The miniature, waterproof camera head is equipped with 360-degree pan and 180-degree tilt technology and a bright LED light. Follow the camera's



path on its TFT color monitor and watch as it negotiates 90-degree bends. Its digital distance measurement feature pinpoints the exact location of trouble spots. **978/750-9876; www.wohlerusa.com.**

Mainline inspection camera system

The **eCAM Pro 2** mainline pipeline inspection camera system from **Electric Eel** features a stainless steel-housed 1.68-inch self-leveling color camera with sapphire lens, a 20-LED light ring (with an impact-resistant polycarbonate light ring cover) and a high-resolution CCD element. The

auto iris adjusts light automatically. A flexible camera spring is designed to navigate 3-inch P-traps. It comes standard with 200 feet of Kevlar-braided 1/2-inch-diameter pushrod and a 512 Hz sonde. It also features a 10.4-inch daylight readable monitor with click touch controls, an onscreen footage counter, a two-hour battery with built-in charger, adjustable light controls, 16 pages of text writing with memory saves, voice over recording, an 8X zoom function, audio/video out jacks, 8-inch wheels, a securelocking reel brake, and powder-coated steel tube and bar construction. **800/833-1212; www.electriceel.com**.



Portable video inspection system

Portable video camera inspection systems from **Zistos Corporation** are battery operated, and feature interchangeable camera options, including dual view thermal, black and white, a self-illuminated 10:1 color zoom, and a variety of other self-illuminated cameras. Its tripodmounted display isolates the operator, and telescoping fiberglass extension poles of various lengths are available. Its optional thermal imager sees temperature differences through



smoke and in total darkness. It has optional image recording capability for documentation of findings, an ideal option to avoid confined space entry. **631/434-1370; www.zistos.com.**

Recording/Archiving/Data Devices

Ultrasonic leak detector kit

The **Ultrasonic Leak Detector Kit** from **Forbest Products** is designed to pinpoint the exact location of the leak point quickly. Ultrasonic sound (20 to 100 KHz) is generated by turbulence created by water, air or gas forced through a small leak. With the kit, users can detect pressure, vacuum and exhaust system leaks, along with tank, pipe, steam



trap and gas leaks. With frequency response in the 36 to 44 KHz range, the kit is centered at 40 KHz. The kit includes the detector, transmitter, focusing probe, flared tube and headphones. The detector amplifies and converts the turbulent ultrasonic noise of a leak to an audible hissing sound. **650/757-4786; www.forbestusa.net.**

Hydrant pressure logger

The **PL200-H** hydrant pressure logger from **Global Water, a Xylem brand,** identifies and locates distribution pressure problems, and obtains a wealth of system modeling data. Its EZ-connect adapter system connects directly to a standard 2 1/2-inch NST fire hydrant port, or adapts to other hose and special threads. Its memory buffer will



store over 81,000 pressure readings with user-defined intervals from once per second to periods longer than a year. Its 10-samples-per-second sampling mode can capture momentary events like water hammers. Programmable start and stop alarm times allow it to synchronize multiple loggers so they will start at the same time, delay starting until a preset time, or limit the number of recordings during a day. **800/876-1172; www.globalw.com.**

Software/Data Devices

GIS interface

The **GIS** interface system from **Cobra Technologies** integrates the capabilities of ESRI ArcGIS into CCTV inspection

software, allowing technicians to pre-load inspections by pre-populating the fields using layer fields. This reduces the time needed for data input on the inspection, and also helps validate the layer information against the latest CCTV inspections. Also improved is the data validation between the GIS layer information and the information captured during the CCTV inspection. Underground infrastructure is managed by automatically color-coding layers using the PACP inspection rating or observation type. **800/443-3761; www.cobratec.com.**

Mobile workforce automation

FlexOps from **FlexSystems** is a mobile workforce automation package designed for plant operations inspections. It addresses the blind spots of SCADA by standardizing manual procedures with touch-screen-guided, PDA-based inspections, eradicating transcription errors and secondary data capturing, validating data at the point of entry and



providing customization. It provides an electronic method of performing critical manual inspections, ensuring all are correctly carried out, and data inputs are validated and consequently imported into the operations system or spreadsheet. Supervisors receive secure, validated data through automated reports that include daily activity, work order requests, fire safety and exception reports delivered to them by email. **303/684-8303;** www.flexops.net.

Mobile accounting software

Foundation Mobile is a Web-based application for mobile devices that works with Foundation for Windows construction accounting software to streamline timecard and job data between field and office. It runs on multiple devices, including smart phones (Droid, iPhone, Blackberry, etc.), iPads, tab-



lets, netbooks, ruggedized laptops and others. It also has offline capability that allows users to enter data even when out of service range. Its intuitive interface includes user-friendly entry and list screens. **800/246-0800; www.foundationsoft.com.**

Hydrant testing software

IMS software with Fire Flow Pro from **Hurco** is easy to use and can help technicians create work orders and generate detailed reports. It helps conduct fire flow tests that let the water district know the true predicted flows at a fire hydrant. If a



section of the distribution system has noticeably poor pressure or flow, tuberculation might be the problem and a C-factor test can quickly identify it. A valve-exercising program will ensure that water valves can be found and work in an emergency. A unidirectional flushing program will start at the source of the water, flushing towards the periphery of the system. By isolating sections to flush, you can develop the necessary velocity to clean the mains thoroughly and help eliminate customer complaints. **800/888-1436; www.gethurco.com.**

Managed SCADA system

The managed **SCADA system** from **Mission Communications** is a complete monitoring and controls system that allows municipalities to better manage, operate and maintain collection and distribution systems. Real-time alarms are delivered by any combination of voice phone calls, text messages, emails, faxes and pagers, and each alarm is logged on the Web portal. Because the system is Web-based, enhancements



and new features are immediately available at no extra cost. Compare pump station flow with local rainfall, analyze pump runtimes for anomalies or track site access with reports tailored to the water and wastewater industry. Reports assist with preventing noncompliant events from occurring. The Web portal can be accessed anytime, anywhere from any Webenabled device. **877/993-1911; www.123mc.com.**

Pipe inspection software

WinCan ProTouch pipe inspection software from Pipeline Analytics allows operators to document pipe inspections made with a video crawler, push camera or zoom survey camera. It's ideal for assessing the condition of collection system assets. It is fully compatible with WinCan v8. It distills the most popular functionality of WinCan v8 into a simple touch-screen interface, with all the tools necessary to document manhole, mainline and lateral inspections. It generates basic manhole-to-manhole reports that include schematics and captured images, and can export inspections to freely distributable viewer software, so clients can review video alongside section detail. Data uploads seamlessly to WinCan v8 for advanced reporting, filtering/querying, and GIS integration. It works with all common video inspection hardware, including video crawlers, push cameras, and

zoom survey cameras. It can even recognize on-screen text, so in most cases no serial connection is needed to acquire distance data. 877/626-8386; www.pipelineanalytics.com.

Data-collection software

PipeLogix software offers the power to collect data and evaluate underground infrastructure assets. It is PACP certified and works with all CCTV systems. Data can be captured, analyzed and shared about mainlines, laterals, manholes, grout and



inclinometer surveys. The program offers reporting features that include score report, score graph, defect by inspection, pipe graphic, tabular and survey list. Built-in GIS tools enable the user to import asset details from map programs directly into the pipe survey form; export shape files or feature classes in geodatabases from the program based on completed surveys, defect types, new assets found or pipe score values; and easily identify surveyed pipes on maps with color coding. It also interfaces with popular industry-standard asset management programs such as Lucity, Cityworks and Infor. **866/299-3150; www.pipelogix.com. ◆**





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PRODUCT NEWS

AUGUST 2013

Product Spotlight High dynamic range radar locates non-metallic objects

By Ed Wodalski

he Easy Locator HDR (high dynamic range) penetrating radar from MALA is designed to specifically detect metallic and nonmetallic utilities. Taking a slice of the ground below, the monitor's zoom function enables the user to view small, near-surface objects or zoom out to view deeper targets, including plastic, asphalt composite, concrete, terracotta and other non-conductive objects.

"The radar is non-contacting. It doesn't have to have a signal coupled to it. It doesn't use tracer wires," says Matt Wolf, president, MALA Geoscience USA Inc. "It puts electromagnetic energy into the ground and receives it back, very similar to sonar."

Unlike standard locating tools, penetrating radar does not require prior knowledge of what lies beneath the surface, Wolf says. "This is kind of an odd thing to say, but you more or less have to know where the utility is to actually locate it using electromagnetics (EM). Now with radar, you can sweep the ground and see indications that utilities are there and you can trace it, having no knowledge that there's a junction box or some kind of connection down the pathway or road. So it's a good tool to do a blind sweep and survey an area at the same time for utilities underground."

The all-in-one HDR unit (26 by 19 by 7 inches, excluding handle) has a folding hinged shaft for easy transport and molded plastic aluminum casing to protect sensitive components from weather and harsh environments. Powered by a 12-volt lithium-ion battery, it has an operating temperature of -20 to 120 degrees F and 450 MHz HDR antenna. Maximum operating speed is approximately 15 mph with a scan rate of 1,024 scans per second.

"When we say the center frequency on our transducer transistor is 450 MHz, that's not telling the whole story," Wolf says. "It's really a

transducer that emits energy well above that frequency and well below it. In the past, we were never able to

digitally capture the outer

edges of that energy. But because of advances in computers, we are now able to pull out energy and data on the farther extremes of that center frequency. What the user now gets is about 20 percent more ground penetration with increased resolution.'

Delivering up to 14 hours of run time, the HDR locator has a built-in DGPS (differential global positioning system) receiver for

simplified positioning of identified utilities and upgradable GPS Mapper software for digital utility mapping using the 10.4-inch color TFT, sunlight readable LCD monitor. The system's screen capture function enables the user to create screen shots in JPEG format to record and archive.

"You basically turn it on, hit start, and as you're walking along, the data starts scrolling. It looks just like a fish-finder," Wolf says. A chevronlike image targets underground objects, which can be marked and evaluated for depth.

"If you want to trace just that line, you make a 180-degree turn and come back over it a few feet away [until you see the chevron]." 843/852-5021; www.malags.com.

Envirosight desk-mount **ROVVER** control

The DCX5000 Command Center from Envirosight provides fingertip access to all ROVVER X functions from a single interface. Twin proportional joysticks control camera and crawler movement, while thumbwheels control illumination intensity, cruise speed, camera height and reel force. The 10-inch tiltable LCD touchscreen lets the operator drill down to deeper functions. 866/936-8476; www.envirosight.com.

Juniper Systems RFID readers

IDBLUE RFID (radio frequency identification) readers from Juniper Systems, in partnership with IDBLUE, are designed for short-range applications, including asset management and tracking. The pen-shaped reader doubles as a capacitive stylus and is available in both high frequency and ultra-high frequency with pending Class 1, Division 2 certification for hazardous conditions. 435/753-1881; www.junipersys.com.

RIDGID advanced lithium 18V batteries



Advanced lithium 18V batteries from RIDGID are available in 2.0 Ah and 4.0 Ah sizes and have an operating range of 29 degrees to 158 degrees F. The 2.0 Ah battery, which comes standard with all RIDGID battery-powered press tools, can deliver 200 presses per charge, while the 4.0 Ah battery delivers 400 presses per charge. Both batteries have a lifespan of 400 to 500 charges. 800/769-7743; www.ridgid.com.



Rhino Linings polyurea coating The SolarMax 11-70 pure polyurea aliphatic coating from Rhino Linings Corp. is UV and color stable and resistant to humidity and substrate moisture during application. The 100-percent solids (no VOCs) high-pressure, spray-applied coating protects steel,

concrete, geotextile, foam, wood or aged polyester fiberglass. 800/422-2603; www.rhinolinings.com.

Easy Locator HDR from MALA





Godwin self-priming dewatering pumps The Godwin HL260 Dri-Prime centrifugal pump from Xylem handles up to 3-inch solids, while the high-head option 10-inch HL260M pump provides flows to 5,300 gpm and discharges up to

500 feet TDH or 216 psi. Options include diesel, gasoline or electric motor, highway trailer or skid mount and sound attenuated enclosures. 800/247-8674; www.godwinpumps.com.

Singer single-point insertion flowmeter



The model 106-SPI-MV single-point insertion electro-magnetic flowmeter from Singer Valve, in partnership with McCrometer, can be utilized with the metering valve as a stand-alone option or built

into a 106-2SC-PCO pilot system to provide complete flow-based valve control. The insertion probe extends into the flow stream in one of the valve inlet connections and protrudes into the valve, equivalent to one-eighth of the valve diameter. The bullet nose eliminates clogging or buildup and has no moving parts. 604/594-5404; www.singervalve.com.

📙 Pipeline Renewal lateral cutter



The Micro Premium lateral cutter from Pipeline Renewal Technologies, 30 percent more powerful than the smaller Micro Pro, can make cuts 100 feet inside pipe 3 to 6 inches in diameter (up to 10 inches available). An illuminated camera with digital monitor/ recorder and configured water/air cleaning delivers real-time cutting footage, while a

pressure alarm warns against water ingress. The system travels on a wheeled chassis, accepts interchangeable cutting heads and can be field maintained. 866/936-8476; www.pipelinert.com.

W.R. Grace chemical grout

Gelacyl SR De Neef chemical grout from W.R. Grace Corp. is an acrylamide-free resin designed for use in mainline and lateral grouting. The polyacrylate resin has no environmental labeling requirements and resists bacteria and fungi found in sewer systems. 800/732-0166; www. deneef.com.

Super Products HDX



driven pump that delivers up to 14 gpm and pressure to 3,000 psi. The 8-inch positive displacement vacuum system provides air flow to 5,800 cfm and 28 inches of vacuum. Single-mode filtration enables the loading of wet and dry material with no changeover. The 1/4-inch steel collector box holds 18 cubic yards. The 8-foot articulating boom provides 330-degree rotation and 27-foot reach. It can pivot 45 degrees upward and 25 degrees downward. Boom functions can be operated with either a wireless remote or wired pendant. 800/837-9711; www.superproductsllc.com.



Highway Products pickup bed boxes

High-side toolboxes for pickup trucks from Highway Products, available in sizes to fit all trucks, mount on bed rails and feature 1/8-inch-thick marine-grade aluminum construction. Theft-resistant

T-handle stainless steel locks keep tools secure, while neoprene weather stripping keeps them dry. 800/866-5269; www.800toolbox.com.

DC Matic electric impact wrench

The model 900, 24-volt DC electric impact wrench from DC Matic Enterprises generates 1,000 ft-lbs of working torque when powered by a 24-volt portable power



pack or connected to any NATO vehicle's power receptacle by a 25-foot twin-lead cable. The tool's sealed housing has a forward/reverse switch and 12-cluster safety work light. 866/419-5602; www.dcmatic.com.



US Jetting protective clothing

Properator personal protective clothing from US Jetting is made from lightweight and flexible Dyneema. The outer protective fabric is lined for comfort. Designed to protect against waterjetting hazards, the apparel meets OSHA safety stan-

dards. The clothing line includes gloves, aprons, trousers, hooded jackets and overalls that protect the entire head. 800/538-8464; www.usjetting.com.

Metabo lightweight angle grinders

W720 and W820 lightweight angle grinders from Metabo Corp. are made for cutting, grinding and deburring. The W720 weighs 4.4 pounds and has a maximum wheel diameter of 4.5 inches. Features include a 6.5 amp motor with 720 watts of power, 14 in-lbs of torque and no-load speed of 11,000 rpm. The W820 weighs 4.7 pounds and has a maximum

wheel diameter of 5 inches. It has a 7.5 amp motor with 820 watts of power, 16 in-lbs of torque and no-load speed of 10,000 rpm. 800/638-2264; www.metabousa.com.

Tideflex curved bill check valve

The TF-1 check valve from Tideflex Technologies has a bill formed into a curve that returns to a closed position, sealing against backflows, including low flow rates. The flat bottom design allows for installation where the invert of the pipe is close to the floor. 412/279-0044; www.redvalve.com. ◆



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SJE-Rhombus names sales representative

SJE-Rhombus named Northeast Sales Associates to represent its product line in Upstate New York. NESA's sales team includes six outside representatives, two inside sales/service associates, a quotation manager and an office manager.

RapidView introduces GET FIT program, offers SeptemberFest training seminar

RapidView IBAK North America is sponsoring sprint triathlons, half-marathons, half-century cycling rides and 5K running events as part of its industry-wide GET FIT with RapidView Summer Program. Designed to promote exercise and a healthier lifestyle, participants can register at www.rapidview/getfit, share their fitness goals and receive a pedometer to track their progress. RapidView also will host its biannual SeptemberFest open house, Sept. 11-12, at its Rochester, Ind., headquarters. The open house will include hands-on maintenance and repair classes, PACP/MACP certification training, product demonstrations and new technology seminars. To register, call 800/656-4225 or visit www. rapidview.com.

Grundfos breaks ground on

North American headquarters

Denmark-based pump manufacturer Grundfos broke ground on its North American headquarters building in Downers Grove, Ill. Pursuing LEED Silver certification for the site, the facility will feature low-flow water fixtures, Energy Star-approved office appliances, heating, ventilation and air conditioning free of chlorofluorocarbon-based refrigerants. Up to 75 percent of construction waste will be diverted to recycling facilities, with office furniture, carpet and ceiling tiles featuring at least 20 percent recycled materials.

Hamilton Kent celebrates 70 years of sealing connections

Hamilton Kent, founded in 1943 in Kent, Ohio, as a manufacturer of components for the war effort, celebrates its 70th anniversary this year. Operating out of Toronto, Ontario, and Winchester, Tenn., Hamilton Kent manufactures gaskets, connectors and other sealing components for underground municipal infrastructure.

Johnson Matthey names distributor

Johnson Matthey's Stationary Emissions Control (SEC) group named RES Energy Solutions of Houston, Texas, as a distributor of its emissions control products for stationary diesel and gasoline engines, including Modulex catalytic converters, SCR systems and oxidation catalysts.

Pipe Restoration Services receives award,

named company of month

Pipe Restoration Services, a joint venture between Morrison Utility Services and U.S.-based Pipe Restoration Technologies, was named a UK Energy Innovation Award winner in the Best Innovation Implemented or Adopted by a Contractor category. The award was presented to PRS for adapting ePIPE, a technology initially introduced in the UK to eliminate lead and leaks in water and now being developed to extend asset life for gas riser systems. PRS also was selected Company of the Month by *Buildings and Facilities News*.

Aquatherm releases new logo, product lines



Aquatherm GmbH and its North American partner, Aquatherm North America, released a refreshed logo and new product lines. The German-based pipe manufacturer and supplier of polypropylene-random piping system offers seven major product lines, with five available in North America. For the sake of unity and clarity, the Aquatherm product lines will be identified using a color-coded convention, originally tested in the U.S. market when Aquatherm's original piping product, Fusiotherm, was renamed Aquatherm Greenpipe. With the new naming, Aquatherm Greenpipe will become Aquatherm Green Pipe and Climatherm will become Aquatherm Blue Pipe. Aquatherm Lilac Pipe will remain unchanged.

Vacuum Truck Rentals adds Sewer Equipment models

Vacuum Truck Rentals added the Sewer Equipment Co. of America models 800 HPR ECO truck jet and 747-FR2000 ECO trailer jet to its rental fleet. Vacuum Truck Rentals has locations in Indiana, Louisiana, Massachusetts, Mississippi, New Jersey, South Carolina and Texas. It offers lease and rent-to-own options for the municipal and industrial markets.

MTech launches website

MTech launched its upgraded website, www.mtechcompany.com. The new site is designed to make scrolling and navigation of product photos and categories easier.



Thompson Pumps holds Pumpology School

Thompson Pump & Manufacturing Co. held its 23rd annual Pumpology School in April at its corporate facilities in Port Orange, Fla. A total of 55 attendees from 15 states and seven foreign countries took part in the three-day workshop that included training sessions for sales and service professionals.

Ditch Witch presents sales, service awards

Ditch Witch presented Detlef Kaiser of German-based Tramann+ Sohn with the 2012 Lowell Highfill Award, the organization's highest recognition for sales performance, and awarded Brent Zerr of Ditch Witch of Oklahoma with the Gold Ace Award for highest worldwide sales volume. Ditch Witch also awarded Josh Kennedy of Ditch Witch of Oklahoma with the Harold Chestnut Award, its highest recognition for service, and awarded Jeff Lone of Ditch Witch Midwest with its 2012 Service Manager of the Year award.



HammerHead receives innovative

product award

HammerHead Trenchless Equipment's 34-inch ramming hammer received the Joseph L. Abbott Jr. Innovative Product Award at the North American Society for Trenchless Technology Annual No-Dig Show.

T-Rex adds 35th hydroexcavation truck to fleet

T-Rex Hydro Excavation and Industrial Vacuum Services of Houston, Texas, added a 35th hydroexcavator to its fleet, with plans to add 14 more GapVax HV-55 hydroexcavators and 40 employees by year's end. T-Rex provides non-destructive hydro and air excavation services through four offices in Texas, serving a growing number of projects from shale oil exploration and pipeline construction in the Eagle Ford and Permian Basin areas.

Hanson Pipe plant surpasses 1 million injury-free hours

Hanson Pipe & Precast's Cambridge, Ontario, plant surpassed one million hours without a lost-time injury over a seven-year period. The 43-acre facility and its 100 employees manufactures precast concrete structural products, including concrete box culverts, reinforced concrete pipe, maintenance holes and catch basins. \blacklozenge



NASSCO CORNER **ICGA PAST, PRESENT AND FUTURE**

NASSCO's divisions help support and promote specific trenchless technologies

By Ted DeBoda, P.E.

ASSCO's mission is to set industry standards for the assessment and rehabilitation of underground infrastructure and to assure the continued acceptance of trenchless technologies. In doing so, we provide unbiased support to all technologies equally. For those interested in diving a bit deeper into specific trenchless technologies, NASSCO divisions, such as the ICGA (Infiltration Control Grouting Association) provide additional information and support.

ICGA was formed nearly 20 years ago. Originally a NASSCO committee, the Grout Task Force focused on the proper use of chemical grout to stop infiltration in collection systems. ICGA, which is open to current NASSCO members in good standing, now has an active membership base of 30 contractors, manufacturers, municipalities and engineers across North America.

Dick Schantz, a former chairman of ICGA who also recently retired from Aries Industries, shared his sage advice about the future of ICGA: "I believe the best way for ICGA to make a real impact on this industry is to hear other people's ideas and keep chemical grout positioned as a viable solution. There are 5 billion feet of sewers in the U.S. with the vast majority of older pipe being VCP [vitrified clay pipe] that has joints every few feet. The pipe is very corrosion-resistant and structurally strong. The problem is the joint. With over a billion sewer

joints out there, the joints are as much in the trench as in the pipe. Chemical grout seals the soil in the trench so the water in the trench doesn't enter the pipe. It's the only practical solution. The problem is that you can't inspect it, can't take a sample, so it's very difficult for engineers to get comfortable with the process. As I retire and move on, my hope for ICGA is that strides will continue to be made in increased confidence of engineers, and that they take chemical grout as a serious solution."

Over the past few years, under the leadership of current Chairman Marc Anctil of Logiball, many steps have been made to accomplish this goal. "Our members have worked very hard in the development of ASTM standards, along with white

papers and the NASSCO method specifications that were released in 2012," said Anctil. "ICGA's role is to promote through its members, trade shows, conferences, publications and other efforts that chemical grouting is a proven maintenance procedure to reduce infiltration and extend the useful life of our sewers.

"ICGA has recently partnered with WEF (Water Environment Federation) and NASSCO to produce an informational webinar on Sept. 18," continued Anctil. "The webinar will cover the process, proven value and many benefits of chemical grouting." +

Ted DeBoda is executive director of NASSCO. He can be reached at director@nassco.org.

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September 16-18, 2013

NASSCO Training Center in Marriottsville, MD Includes Manholes and Laterals! For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

September 24-26, 2013

Las Vegas, NV (Tri-States Conference) Include Manholes and Laterals! A limited number of PACP Recertifications will be accepted. For more information or to register contact Marilyn Shepard at 916-899-8961 or mshepard1@hotmail.com

September 30-October 2, 2013 Twinsburg, OH

Includes Manholes and Laterals! Jack Doheny Open House Equipment/Training Show

(Thurs. October 3, All Invited!)

Trainer: Brandon Conley For more information or to register contact Kay Doheny at 248-349-0905 or pacp@ dohenysupplies.com

October 8-10, 2013

Chicago, IL Includes Manholes and Laterals! One day PACP Recertification on the 11th. For more information or to register contact Paul Booth at 704-681-3989 or woodsideenv@gmail.com PACP User Recertification

October 21-23, 2013

NASSCO Training Center in Marriottsville, MD Includes Manholes and Laterals! For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

November 18-20, 2013

NASSCO Training Center in Marriottsville, MD Includes Manholes and Laterals! For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

PACP RECERTIFICATION

September 10, 2013 NASSCO Training Center in Marriottsville, MD PACP User Recertification

For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

October 11, 2013

Chicago, IL PACP User Recertification For more information or to register contact Paul Booth at 704-681-3989 or woodsideenv@gmail.com

November 12, 2013

NASSCO Training Center in Marriottsville, MD For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

ITCP TRAINING

September 26-27, 2013 Portland, OR

Manhole Rehabilitation 8 a.m. - 5 p.m. daily Trainer: Rocky Capehart For more information contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

If you are interested in having a class at your facility or in your area, contact Gerry Muenchmeyer at 252-626-9930 or gmuenchmeyer@suddenlink.net

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NASSCO (National Association of Sewer Service Companies) is located at 11521 Cronridge Drive, Suite J, Owings Mills, MD 21117; 410/486-3500; www.nassco.org





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WORTH NOTING

PEOPLE/AWARDS

The Illinois Association of Floodplain and Stormwater Managers announced the following award recipients for 2013:

- Stormwater Management of the Year Award: DuPage County Stormwater Management
- Floodplain Manager of the Year Award: Lake County Stormwater Management Commission
- Outstanding Service Award: **Sarah Harbaugh** of the Illinois Association of Floodplain and Stormwater Managers
- Mitigation Award: City of Champaign
- Public Education Award: River Action organization
- Lifetime Achievement Award: Patrick J. Glithero

Oklahoma City Mayor Mick Cornett and the city's Storm Water Quality Division received the Patriot Award from the Department of Defense for extraordinary support of employees serving in the Oklahoma National Guard and Reserve.

The **City of Rome, N.Y.,** received an Environmental Excellence Award from the New York State Department of Environmental Conservation for its Canopy Restoration Project. The innovative approach to stormwater management focused on using urban forestry to reuse vacant building space, increase property value, reduce runoff and reinvest in the city's urban core.

Sen. Thad Cochran was the guest of honor at the Mississippi Rural Water Association's 2013 Technical Conference in Jackson, Miss.

The American Public Works Association announced its Top Ten Public Works Leaders of 2013 honorees. They include:

- Wylie Bearup, street transportation director/city engineer, City of Phoenix, Ariz.
- Julia Bueren, public works director, Contra Costa County, Calif.
- Christopher B. Burke, Christopher B. Burke Engineering, Rosemont, Ill.
- John Edlebeck, director of public works/city engineer, City of Waupaca, Wis.
- Melissa Gentry, assistant city manager for operations, City of Columbia, S.C.

See Both Sides

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CALENDAR

Aug. 6-8

Water Environment Federation/International Society of Automation's Water/Wastewater and Automatic Controls Symposium, Crowne Plaza Orlando-Universal Hotel, Orlando, Fla.Visit www.wef.org.

Aug. 18-22

StormCon: North American Surface Water Quality Conference and Exposition, Myrtle Beach Convention Center; Myrtle Beach, S.C.Visit www.stormcon.com.

Aug. 25-28

American Public Works Association International Public Works Congress & Exposition, McCormick Place, Chicago. Call 816/595-5241 or visit www.apwa.net.

Oct. I-3

National Rural Water Association H2O-XPO, Louisville, Ky. Visit www.h2o-expo.org.

Oct. 5-9

Water Environment Federation's Technical Exhibition and Conference, McCormick Place South, Chicago. Visit www.wef.org.

Oct. 10-12

American Society of Civil Engineers 2013 Annual Conference, Charlotte Convention Center, Charlotte, N.C.Visit www.asce.org.

Nov. 4-7

American Water Resources Association Annual Conference, Red Lion Hotel, Portland, Ore.Visit www.awra.org.

- William Hadley, public works director, Town of Lexington, Mass.
- Donald Jacobovitz, public works director, Putnam County, Fla.
- Howard Lazarus, director of public works, City of Austin, Texas
- Thomas Montgomery, public works director, City of Hastings, Minn.
- Allen Persons, director of public works, Village of Plainfield, Ill.

MSW welcomes your contribution to this listing. Please send notices of new hires, promotions, service milestones, certifications or achievements to editor@mswmag.com.

LEARNING OPPORTUNITIES

American Society of Civil Engineers

The ASCE has these courses:

- Aug. 1-2 Pumping Systems Design for Civil Engineers, Hyannis, Mass.
- Aug. 6 Cold-Weather Stormwater BMPs That Work, online
- Aug. 12 Aging Infrastructure, Risks and Making Tough Decisions, online
- Sept. 19 Stormwater BMPs: What Works, What Doesn't and What About Maintenance, online
- Sept. 23 Creating Design Storms for Rainfall-Runoff Models, online
- Sept. 26-27 Pumping Systems Design for Civil Engineers, Austin, Texas

Visit www.asce.org

American Water Works Association

The AWWA has a Dam Safety 2013 seminar on Sept. 8-12 in Providence, R.I. Visit www.awwa.org

Wisconsin

The University of Wisconsin Department of Engineering-Professional Development has a Using WinSLAMM v. 10: Meeting Urban Stormwater Goals P010 seminar on Oct. 14-15 in Madison. Visit http://epdweb.engr. wisc.edu. ◆

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

What makes it all work is the people. I am really proud of our team. We look for responsibility and a good work ethic. We can teach wastewater operation or lab technique, but we can't teach character. Each person brings that with them the first day."

James Pendleton Plant Superintendent Harpeth Valley Utilities District Wastewater Treatment Plant Nashville, Tenn.

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UPCOMING SHOWS: Sept. 9-11 WJTA-IMCA Expo - Houston, TX Sept. 12 PA SAFETY DAYS - Monroesville, PA Sept. 18-19 South Texas Oilfield Expo - Corpus Christi, TX Sept. 24-26 Tri-State Seminar on the River - South Point, NV

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