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Rex Rentz
Code enforcement officer
Daphne, Ala.

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Daphne, Ala., fights FOG and cultivates customer relations

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LIFT STATIONS AND CONVEYANCE

ON THE COVER:
City of Daphne, Ala., code enforcement officer Rex Rentz checks a grease trap at a local restaurant using a grease judge Stick from Earth Clean Services. Controlling FOG has been a big part of the city's efforts to improve its collections system. (Photography by Lyle Ratliff)

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EFFECTIVE OPERATION

Utilities must search for ways to get more from their limited resources

FROM THE EDITOR

Luke Laggis

In today's municipal world, where utility departments are continually asked to do more with less, efficiency is critical. Funds are limited, resources are precious, and manpower is often stretched thin. If your system or your operations are inefficient, tasks that should be simple will become more time- and labor-intensive. Emergency situations will become more complicated and will be a greater strain. You'll struggle to stay on top of maintenance, and that will only make the situation worse.

The folks at Daphne Utilities in Daphne, Ala., know a thing or two about efficiency. The utility, profiled in this issue of *MSW,* has undergone a significant transformation in recent years. At one time the town had a terrible environmental record, but with new management and a new approach, it has made a dramatic turnaround.

"The phrase 'good enough for government work' angers me every time I hear it because it represents waste and inefficiency," says general manager Rob McElroy. "We have to work hard to overcome that. There was a time when being 'good enough' might have been good enough, but that time has gone. In a downturned economy, our customers don't have the money to fund regular rate increases for what they perceive as poor service from uncaring employees and the inefficient use of the money already given to us. We want to bring more efficiency into our system, to run like a business."

While it's not uncommon to hear public officials and political candidates talk about running government like a business, it's less common to actually see the proper manifestation of the mantra. McElroy and his crew haven't turned their utility into a cold, faceless entity where the bottom line is everything; they've turned their utility into a responsible arm of government where fiscal sensibility is critical and great customer service is the bottom line.

McElroy and his crew haven't turned their utility into a cold, faceless entity where the bottom line is everything; they've turned their utility into a responsible arm of government where fiscal sensibility is critical and great customer service is the bottom line.

Rather than cutting and cutting until all the flesh has been peeled from the utility's cast iron and concrete skeleton, they have found new efficiencies and innovative new ways to meet their goals without placing an inordinate burden on the local taxpayers.

It's a difficult task, but one that all municipal utilities must take on.

Aurora, Ill., also featured in this issue, has gone about improving efficiency in a different way. The city has invested heavily to separate combined sewers and develop green infrastructure to naturally treat stormwater. As a result, the city isn't paying to treat stormwater, and the local waterways are cleaner.

The city had previously planned on installing several hundred feet of storm sewers to serve the area around a local park. Instead, three bioretention basins were installed along the parkway. The project proved to be a huge success due to its operational and cost efficiencies. While installing storm sewers would have cost $140,000, the bioretention basins cost just $70,000. More rain gardens are planned, and the cost will be less than half what it would cost to make similar improvements with gray infrastructure. That's wise use of the taxpayers' dollars, and a blueprint for efficiency.

Perhaps your utilities have already taken on similar projects, but maybe these stories can serve as your own blueprint for more efficient operations and happier customers. That's our hope.

Enjoy this month's issue. ✦

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City of Aurora engineer Eric Schoeny, P.E., Mayor Tom Weisner, and director of Public Works Ken Schroth, P.E., examine a new drainage area. (Photography by John Bonk)

FOCUS: STORM

NO GRAY AREA

Green infrastructure helps Aurora, Ill., manage stormwater and improve the health of local waterways

By Lisa Balcerak

Combined sewer systems were the best solution for city water management in the 1800s, but their pollution of waterways is a struggle for today's communities. Aurora, the second largest city in Illinois, knows this fact firsthand.

The city has made it a priority to use green infrastructure to better manage stormwater in an effort to reduce pollution to the nearby Fox River, a 202-mile-long tributary of the Mississippi that weaves through several counties in Southeastern Wisconsin and Northeastern Illinois. The river has been deemed an impaired waterway by the state of Illinois.

In 2011, Aurora's innovative and environmentally responsible stormwater management practices earned it recognition from the Natural Resources Defense Council (NRDC).

From 2007 to 2009, Aurora conducted a study funded by the Illinois Environmental Protection Agency (IEPA) on how to best implement green infrastructure to mitigate the impact of stormwater on the Fox River. The study was initiated by Mayor Thomas Weisner, who has been the driving force behind Aurora's environmentally responsible initiatives. The goal was to find ways to reduce nonpoint source (NPS) pollution that reaches the river, reduce the stormwater runoff peak discharge rate and total volume amount, and develop a naturalized dispersement stormwater management system.

As a result of the study, the city developed an innovative green infrastructure implementation plan that includes several successful naturalized stormwater management projects, a stormwater management toolkit for redevelopment

PROFILE:
Department of Public Works, Water and Sewer Maintenance Division
Aurora, Ill.

POPULATION:
199,672

AREA:
45 square miles

ANNUAL RAINFALL:
37.7 inches

ANNUAL BUDGET:
$360 million

WEBSITE:
www.aurora-il.org

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and a corridor plan that identifies future water quality improvement opportunities.

Aurora identified three stormwater management projects that would treat stormwater through natural processes instead of using traditional gray infrastructure. Using funds from an IEPA grant through the Federal Clean Water Act, the city began work in October 2009, using multiple contractors on each of the three projects.

Over the past 30 years, Aurora has invested over $100 million to separate the combined sewer system. While those steps have helped prevent sewage backups in basements, they did not significantly improve the river's water quality.

"One thing we found is that stormwater is just as dirty as combined sewage because of some pollutants," says Eric Schoeny, city drainage and underground coordinator. "That's how we recognized that green infrastructure needed to be a part of efforts to mitigate combined sewer impacts."

Biofiltration upgrade

To reduce runoff into the river from a 4.5-acre commuter parking lot, Aurora upgraded an existing retention basin that was originally built in 1990. The original 3,100-square-foot retention basin had been designed so that small storm events bypassed the pond, and only large storm events would activate the basin. With such a large impervious area, the city saw the need for improvement.

"You get a lot of pollutants from parking lots because vehicles have an opportunity for dirt and oils to get washed off onto the pavement," Schoeny says. "Due to the original design of the commuter parking lot, 100 percent of the pollutants that washed off the parking lot during small storm events bypassed the detention pond and discharged directly into the river. From a water quality standpoint, that is exactly the opposite of what we wanted. We saw that as a great opportunity to improve water quality."

The retention basin was retrofitted with piping to divert stormwater from small events to the pond. However, the challenge was that it was located alongside a railroad embankment, with lower ground on the other side. Due to the significant grade differential and the heavy fill that had been installed at the turn of the century, piping could not be installed to allow water to infiltrate into the ground. Instead, the basin bottom was covered with an impermeable lining and a sand filter was installed to allow for biofiltration. Native vegetation was planted to help evapotranspirate the water and uptake some nutrients. Now the updated retention basin treats the first 3/4 inch of stormwater runoff. The project cost $65,100 to complete.

Decombination project

To intercept, treat and infiltrate the first 3/4 inch of runoff from a parkway in a residential neighborhood, a series of five rain gardens was installed. Curb cuts divert runoff from the gutter to the rain gardens, which are constructed over a newly installed, 18-foot-deep decombination storm sewer trench. Native sand and gravel were used for the trench backfill and provide excellent infiltration rates.

A topsoil mixture of sand, black dirt and leaf/mushroom compost creates the nutritive bed for native vegetation. The plants were chosen for their tolerance of water submersion and have deep root systems to keep the soil open and allow for infiltration.

In larger storm events, the rain gardens fill with runoff, overflowing from one garden to the next. A portion of the rainwater infiltrates into the ground or is evapotranspirated by the plants. Two of the rain gardens have catch basins that direct non-infiltrated runoff into the storm sewer. The gardens, which fill a 2,700-square-foot area, cost $27,500 to install.

Some residents who were previously unaware of the project happening right in front of their homes expressed objection to the rain gardens. Schoeny and Ken Schroth, city engineer and director of Public Works, talked to the

"One thing we found is that stormwater is just as dirty as combined sewage because of some pollutants. That's how we recognized that green infrastructure needed to be a part of efforts to mitigate combined sewer impacts."

Eric Schoeny

City of Aurora horticulturist Susan Johnson works with butterfly weed *(Asciepias tuberosa)* in a stormwater drainage area.

USING NATIVE PLANTS

For developers, working on Aurora's green infrastructure was not much different from work they are used to doing already, such as excavation, placing fill and grading to create basins. The biggest difference involved the installation and maintenance of native plants.

"Maintenance for native plants is very different from turfgrass," says Eric Schoeny, city drainage and underground coordinator. "Native vegetation often takes two to three years to mature before it can ward off invasive weeds. Within those first couple years after planting, there is more maintenance involved than we're used to with turfgrass. But once the plants take hold, they need less and less maintenance."

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NEW TECHNOLOGY FOR AN OLD PARK

McCarty Park, Aurora's oldest park, was chosen as a site to install green infrastructure to control combined sewer overflows because it is city property requiring no permission from private entities. Crews were already maintaining the landscape, so there would be minimal cost additions for maintenance of the bioretention basins.

Brothers Joseph and Samuel McCarty, founders of Aurora who settled there in 1820, first chose that area to be a protected public park in 1850. Today, this historical landmark is home to some state-of-the-art technology that prevents stormwater from entering the sewer system.

City of Aurora personnel maintain a green drainage area along a city street.

concerned citizens to explain the goals and functions of the rain gardens.

"Public participation is very important," Schoeny says. "It speaks to the saying 'Bring me in at the beginning, I'll be your ally. Bring me in at the end, I will be your critic.'"

From that experience, the Aurora team learned the importance of educating the public on activities and getting them involved in the planning. Today, Aurora continually shares information with residents through exhibits and displays at public events, speaking engagements, public meetings and an educational website.

"Public participation is very important. It speaks to the saying 'Bring me in at the beginning, I'll be your ally. Bring me in at the end, I will be your critic.'"

Eric Schoeny

The new Aurora Police Department building has earned awards for its green features, including this stormwater drainage project.

In stark contrast to the initial objections to the first rain gardens, the Aurora downtown business association has embraced the use of rain gardens as part of a larger reconstruction project to replace two bridges and beautify the business district. Aurora won an Illinois Green Infrastructure Grant from the IEPA to add rain gardens to newly created landscaped areas that are aimed at bringing more foot traffic to downtown shops.

"The entire experience has been a valuable lesson learned," Schoeny says. "Green infrastructure is different from gray infrastructure because it is more visible and interacts with the public. You really need to get the public involved early on."

Wetland bioswale

A large impervious 5.2-acre space along a four-lane highway and industrial parking lot became the site of a stormwater wetland bioswale. The 6,500-square-foot bioswale works similarly to a rain garden, but because it is adjacent to a river, it acts like a wetland because it is full of water for most of the year.

In the bioswale, water is filtered a couple ways. Stormwater runoff from an existing separate storm sewer is diverted to an underground U-shaped detention area. Large solids are filtered out and collected in a tank, which is periodically emptied with a sewer vac truck and treated. The remaining water then enters the bioswale and filters through native vegetation before discharging into the river. The bioswale treats the first 3/4 inch of runoff and helps decrease the peak discharge rate from the drainage area. Total cost for construction was $99,500.

Handbook for redevelopment

To help meet Aurora's stormwater management ordinance for

redevelopment projects, the city's team assembled a Stormwater Management Toolkit. Redeveloping in a heavily urbanized area provides challenges for meeting stormwater storage requirements because there isn't enough space. The toolkit defines water quality improvements to give developers some guidance on how to meet the ordinance requirements.

For example, in lieu of retention requirements, the toolkit provides a metric to remove 40 percent of suspended solids from stormwater discharged from the development site as a result of a 3/4-inch rainwater event. Then it is up to developers to decide how to achieve that net benefit in water quality.

Bioinfiltration at McCarty Park

In 2009, the IEPA made the City of Aurora aware of potential green infrastructure funding through the American Recovery and Reinvestment Act. At the same time, Schroth's team was working to prepare and submit a combined sewer overflow (CSO) long-term control plan, a $120 million unfunded plan that had been mandated by the U.S. EPA and IEPA. The team decided that there was an opportunity to use the ARRA funding to help mitigate CSOs as part of the long-term plan.

The city's beloved McCarty Park was chosen as a site for the project to reduce peak runoff rates to the combined sewer system and reduce discharge of stormwater pollutants to the Fox River. The city had previously planned on installing several hundred feet of storm sewers to serve that area. Instead, three bioretention basins were installed along the parkway. Openings in the existing curb and gutter were created to allow stormwater runoff to enter the basins. An overflow pipe at the downstream end of the basins provides a secondary outlet in the event that rain exceeds the basins' infiltration capacity. A flow meter has been installed in the downstream overflow pipe in order to gauge the long-term performance of the basins.

The McCarty Park project proved to be a huge success due to its operational and cost efficiencies. While installing the storm sewers would have cost $140,000, the bioretention basins cost just $70,000.

"The basins eliminated the need to install expensive storm sewers," Schoeny says. "We were able to remove the same stormwater from the combined sewer at half the cost. Plus, with the green infrastructure, it accomplishes a great water quality improvement and a real nice aesthetic amenity for the public. The McCarty Park project taught us how to identify other locations that are going to be cost-effective for combined sewer control."

Future projects

To identify and assess NPS pollution sources in the area, Aurora developed a Naturalized Stormwater Management Corridor Plan. The plan recommends and prioritizes locations where future water quality projects will be most effective. The document is also a resource to help people understand the impacts of stormwater on the receiving streams and the advantages to implementing naturalized improvements like rain gardens and bioswales.

Using grant money from the IEPA, Aurora will be installing more rain gardens in 28 intersections in 2013. The cost for the rain gardens will be $1.7 million, however, costs to construct gray infrastructure to provide similar improvements to the combined sewer system would cost $3.5 million.

"The entire experience has been a valuable lesson learned. Green infrastructure is different from gray infrastructure because it is more visible and interacts with the public. You really need to get the public involved early on."

Eric Schoeny

"That is some serious money that helps us with our struggle to fund the long-term control plan for combined sewer overflows," Schoeny says. ✦

FOCUS: SEWER

THE PULL OF SUCCESS

City of Marathon overcomes the unique topographic and environmental constraints of wastewater management in the Florida Keys

By Dan Heim

The City of Marathon, Fla., the midpoint of the Florida Keys, is some 75 miles from the mainland on U.S. Route 1, aka The Overseas Highway. The city was incorporated in 1999. Six years later, in response to federal and state mandates on water quality, they embarked on a major infrastructure upgrade. The multimillion-dollar project is now 95 percent complete, and scheduled for conclusion in late 2012.

"We got started early, right after Florida's legislature set the new standards," notes Zully Hemeyer, utilities manager for the Marathon City Utility Department (MCUD). "Back then, there was still a lot of grant money available. Marathon wanted to get the jump on what we knew would be a huge project."

Wastewater management and treatment in the Florida Keys requires atypical solutions to common problems (see sidebar). Other cities in the Keys weren't as quick off the starting line, and will have difficulty meeting the new standards by Florida's 2012 deadline.

"There were a lot of things we needed to do to meet those mandates, so we took it upon ourselves," says Carlos Solis, P.E., Public Works manager. "We issued bonds, we borrowed money, we applied for grants."

Waters around Marathon City are designated by the State of Florida as Class III based on their balanced wildlife population and recreational use, and are worthy of special protection because of their natural attributes. That prohibits the use of standard septic systems, and mandates no effluent be directly discharged into surrounding waters.

Further, monitoring programs have been in place for over 10 years, some by NOAA, to track the health of marine species, not the least of which is coral. The Keys are home to the largest living reef in North America, and its health is considered threatened.

Meeting those specs

The 1972 Clean Water Act empowered the EPA to set effluent standards. Many states followed that lead, creating their own environmental programs. In Florida, that was the Water Quality Improvement Initiative (WQII), instituted by the Florida Department of Environmental Protection (DEP).

MCUD, during their planning stage back in 2005, decided to break

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> "We had this one residence, near a canal, off their septic and centrally connected for about eight or nine months. And they noticed that the dolphins were coming back into the canal for the first time in 30 years. Plus, they could actually see the bottom of the canal. Now that's healthy water."
>
> **Carlos Solis**

their system into seven service areas. The service areas were unique, with their own constraints and demands, and each required smart engineering solutions.

"One of the things that was mandated was that everyone gets off existing septic systems, and gets connected to a central sewer system," says Solis. "That was supposed to be done by 2012, and we're just about there."

Solis also shared an interesting story about the changeover. "We had this one residence, near a canal, off their septic and centrally connected for about eight or nine months. And they noticed that the dolphins were coming back into the canal for the first time in 30 years. Plus, they could actually see the bottom of the canal. Now that's healthy water."

Pull, don't push

When you don't have the topographic relief needed for a typical gravity-feed system, the only other option is pumping.

"If you want to use a gravity-feed system, even with pumping stations, those pipes get down 18 to 20 feet," Solis points out. "You just can't do that here. You'd be running into that porous caprock. Turns out the cost is actually less installing a vacuum system."

In the event of a minor break, instead of leaking sewage, the system "sucks air." Either that or gravel and/or saltwater, depending on the location of the break. In any event, monitors at the plant can detect a decrease in vacuum, or increased salinity, and alert operators to the break. The plants use new technology, all highly automated, and can react quickly.

The Marathon team includes, from left, ports director Sean Cannon, equipment maintenance technician Gary Brink, utilities manager Zully Hemeyer, administrative assistant Libby Frazier, customer service representative Tiffany Buwalda, utility maintenance worker Scott Van Hoesen and stormwater maintenance technician Jaime Faircloth.

"So it's more like you're 'pulling' than 'pushing' that sewage to the plants," Solis says. "You don't need much slope, so most of our pipes are horizontal, many only 4 feet deep, 6 at the deepest.

"We also discovered it would be cheaper, almost half the cost, to

PROFILE:
Marathon City Utility Department,
City of Marathon, Fla.

SERVICE AREA:	8.68 square miles
CUSTOMERS:	10,000
POPULATION DENSITY:	580 per square mile average
INFRASTRUCTURE:	66 miles of vacuum-feed sewer pipe, 1,415 vacuum pits, five treatment plants, one vacuum station, 132 grinder pump stations
ANNUAL BUDGET:	Wastewater: $3.5 million operational, $13.3 million capital Stormwater: $357,000 operational, $2.4 million capital
EMPLOYEES:	Wastewater: 2 full-time, 3 part-time Stormwater: 1 full-time
AVERAGE RAINFALL:	46 inches per year
WEBSITE:	www.ci.marathon.fl.us

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build treatment plants in each of our service areas, rather than have one large central plant. It's just too difficult and costly to transmit vacuum over long distances."

Candy canes

Throughout the neighborhoods, there are vacuum pits under the streets serving two to eight homes. These are repositories for waste that is gravity-fed through standard laterals. When the pit reaches capacity, a float opens a valve letting the vacuum draw out the waste.

At each residential service connection, there's a device known as a "candy cane" constructed from 6-inch schedule 40 PVC, about 3 feet tall, with two right-angle turns and a screened cap at the end.

"They're basically a riser for venting, so the vacuum can pull effluent. If you don't let the system pull in air, it won't work," Solis says. "Some people decorate them like real candy canes or other things. But it's good to have them as far from the house as possible, since the air-sucking noise can be loud. No problems with odor though. It's under negative pressure."

The screened end cap prevents fauna and debris from entering the system. But sometimes it can be clogged by dirt, webs or even bird nests. When that happens, the homeowner immediately knows.

"If you do have a clogged intake, weird things happen inside the house when the vacuum kicks in. The water in the toilet bowl gets drawn down. The traps in the sinks start gurgling. You just know something's wrong," Solis says.

Utilities manager Zully Hemeyer and Public Works manager Carlos Solis.

Difficult constraints

Under the new water quality mandates, no effluent from treatment plants can be discharged into either the Gulf or Atlantic. The waters around Vaca Key and most other Keys have been designated Class III by the State of Florida. That classification recognizes the use of those waters for recreation, fishing and wildlife habitats.

"Everyone used to dump their effluent into the ocean, but we've learned much since those times," Solis says. "What we can't use for irrigation, parks, medians, school lawns, goes into an injection well. They're a couple hundred feet deep.

U.S. Water collection system technician Heath Townsend installs a valve in a vacuum pit.

So from there, Nature does the remaining filtration."

Four of the five wastewater plants in Marathon will be able to redistribute reclaimed water for irrigation. "We have one plant, in Area 4, that's piped for reclamation, and that water goes to a park, a golf course and the high school for irrigation," Hemeyer says.

MCUD services a base load of about 80,000 people, but during their peak tourist season (November through April) that number doubles. That means all systems must be designed for excess capacity, and while that excess capacity isn't needed for much of the year, it must nonetheless be maintained.

Hurricanes, of course, present the greatest challenge. If the Keys get a storm surge during high tide, a lot of real estate will be underwater. The treatment plants are designed to survive 175 mph winds, and all

Injection wells are part of the citywide stormwater management system.

LIFE IN THE KEYS

The Florida Keys comprise Monroe County, and are an archipelago, not unlike the Aleutian Islands off the coast of Alaska. They were discovered by Ponce De Leon in 1513. These low islands form a string of Keys 220 miles in length. They extend from the Florida mainland to the Dry Tortugas, between the Gulf of Mexico and the Atlantic Ocean. Their highest point is only 8 feet above sea level.

With that limited topographic relief, conventional gravity-flow design for pipes is not an option beyond laterals. Instead, for wastewater, a vacuum-driven system must be used to "pull" the sewage to the treatment plants.

The Keys are actually an extension of the Appalachian mountains. That bedrock is covered by a limestone called Miami Oolite. In addition, ancient coral reefs overlay some of that limestone. It's not a good place for trenching. Even if you're willing to dig, Oolite is very porous and the buoyant forces on pipes will vary with the tide.

And it's not a very good place to sink a well, unless you're looking for saltwater. Potable water is supplied by the Florida Keys Aqueduct Authority. Water is sent to the Keys via a 36-inch main from the mainland. There are limited applications of reverse osmosis systems to process seawater, but that's the more expensive alternative. Most cities in the Keys maintain large storage tanks as backup in case the main goes down.

ABOVE: Portions of Marathon's wastewater infrastructure, including vacuum pits, are visible in residential areas. **RIGHT:** "Candy cane" risers allow the vacuum system to pull in air.

> **"Everyone used to dump their effluent into the ocean, but we've learned much since those times. What we can't use for irrigation, parks, medians, school lawns, goes into an injection well. They're a couple hundred feet deep. So from there, Nature does the remaining filtration."**
>
> **Carlos Solis**

electrical equipment is located above the levels expected for a storm surge, which Hemeyer notes is required by Florida building code.

"If we have a major hurricane, you're gonna have three to four feet of water across the whole island … that's a given," says Solis. "Obviously, we won't be operating until the water recedes. But as soon as it does, we can get back online using generators, even if the grid is still down."

Camera inspections are still possible, even with the vacuum "on." But it presents its own set of difficulties. "We can cam the pipes, but we have to go in through a vacuum pit by removing the valve. And we need a crawler and camera head less than 2 inches in diameter, since the pipes are much smaller at that point," says Hemeyer. The utility uses its Vac-Con combination unit for cleaning operations.

Preparing for the future

Grassy Key, in Area 7, comprises the remaining 5 percent in MCUD's upgrade project. Because of the way existing infrastructure is installed, that system will use standard low-pressure force mains instead of vacuum. MCUD expects to complete that project by the end of the year.

The City of Marathon is on Vaca Key, surrounded by water, with much of its land area classified as protected wetlands. One would think there's not much room for growth and the associated new infrastructure, but that's not the case.

"Florida has a rate of growth ordinance that only allows so many permits each year," says Solis. "We recognize we're finite, but we do have parcels available for development, and we're trying to attract development with our friendly tax structure. And you'll see a lot of re-development down here, where something built, say 80 years ago, is no longer serving its original purpose."

Customer service rates are also a concern. In the Keys, water and sewer services are intrinsically more difficult to provide.

"Yes, our customers are paying for this new technology, but we're in line with the rest of the Keys here in Monroe County, and we intend to stay there," says Hemeyer. "We don't compare ourselves to the mainland, where the infrastructure has been around for decades."

Whatever challenges are in store, the people at MCUD are confident they can handle it. They have a record of success and the support of their elected officials.

"They take the mandates as seriously as we do," says Hemeyer. "They went out there and got us the funding we needed to do our job. City manager Roger Hernstadt and the City Council have really helped make this all possible."

Solis notes that the funding, along with good engineering choices and good bids from contractors during the economic downturn, have allowed them to complete the work at a cost substantially lower than the original estimates.

"Those good engineering choices are thanks to Weiler [Engineering Corporation], who has some top-rank people, like Ed Castle, P.E.," says Solis. "They've worked with us from day one on this project, and we couldn't have got it done without them. And Susie Thomas here in Marathon was key to coordinating all our efforts with Weiler."

Hemeyer also points to the forethought in coordinating with other agencies as a big factor in making the project so successful. "For example, they saved up their road funds during this project knowing all this new piping was going in," she says. "When we were done, all our roads got new paving.

"We want to be seen by the rest of the country as a shining example of what can be done when a community really puts their mind to something." ✦

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TECHNOLOGY:

FLOW CONTROL

Regular maintenance is the key to keeping your system's valves healthy

By Mark Gimson

Whether that brand new control valve in your system is the first one you have ever had to look after or if you are an old hand at valve maintenance with dozens of valves in your system, there are a few simple guidelines and reminders for keeping them operating at optimal performance.

It's important to physically check valves at least every 12 weeks or so, assuming everything is running fine in the system. This inspection is to check for any leaks in the tubing, check pressure gauges to ensure the valve is actually doing what it is supposed to and generally inspecting for anything that looks abnormal.

If you determine something is wrong, always make sure you have the correct instruction manual for the valve before beginning any repair work. Today, many manufacturers have manuals available on their websites. As a note of caution, these valves are under pressure and care should be taken to bleed off that pressure before you start taking apart any valves. Safety is critical. A 6-inch valve with 100 psi in the line will have at least 2,800 pounds of force trying to push that cover off the valve, more than enough to cause a serious injury.

Valves should be inspected approximately every 12 weeks to make sure everything is in proper working order. Look for leaks in the tubing or anything else that looks abnormal, and check pressure gauges to ensure the valve is performing properly.

Regular maintenance will ensure your valve stays in good working order. Here are some simple tasks you can perform:

Pilot system shutoff ball valves

Exercise the three isolating cocks on the main valve. These are located in front of the strainer on the upstream side of the valve, on the valve bonnet on top of the valve, and below the pressure-reducing pilot on the valve downstream. Giving the isolating cock a momentary quarter turn to the closed position, then returning it to the open position is sufficient. Open position is when the handle of the isolating cock is in line with its body.

Air in the pilot system

Air is your number one enemy

Problem	Probable Cause	Verification	Solution
Valve will not Open	Ball valves in control circuit closed (if equipped)	Check ball valve handle positions	Open ball valves
	Insufficient supply pressure to inlet of main valve	Check upstream and downstream isolation valves	Open upstream and downstream valves
	Cover chamber pressure not being discharged through pilot system	Inspect pilot system	Correct as suggested in troubleshooting section of valve IOM
	Diaphragm failure (Valve flow over the seat)	Pull cover, inspect diaphragm for damage	Replace diaphragm
	Diaphragm assembly not operating properly (eg: stem binding guides)	Inspect diaphragm assembly	Clean or replace damaged parts as necessary
	Flow stabilizer not properly adjusted for control valve start-up	Check that adjustment screw is not turned all the way out	Correct as suggested in troubleshooting section of valve IOM

Problem	Probable Cause	Verification	Solution
Valve will not Close	Cover chamber pressure being discharged through pilot system	Inspect pilot system	Correct as suggested in troubleshooting section of valve IOM
	Strainer is clogged	Disconnect supply line at cover chamber, check for flow	Remove and clean strainer
	Resilient disc is damaged	Inspect resilient disc	Flip the disc over or replace
	Diaphragm failure (Valve flow under the seat)	Pull cover, inspect diaphragm for damage	Replace diaphragm
	Obstruction	Bleed bonnet until water stops flowing to confirm diaphragm ok.	Disassemble valve and remove blockage

Problem	Probable Cause	Verification	Solution
Valve will not Modulate	Air in control circuit or pilots		Bleed all air
	Pilot is not adjusted correctly	Turn adjusting screw on pilot and check response	Re-adjust pilot
	Opening and/or closing speed controls not adjusted correctly	Turn adjusting screws and check response	Adjust opening and/or closing speed needle valves
	Operating conditions do not fall within the spring range of the pilot	1. Check tag on pilot for proper spring range	1. Replace with pilot of correct spring range
		2. Adjust the screw all the way in and all the way out to check for pilot response	2. Replace with pilot of correct spring range
		3. Read gauges/meters to ensure proper operating conditions	3. Change operating conditions to desired range or change pilot set point

Photo and graphics courtesy of Singer Valve

These troubleshooting guides provide probable causes and solutions to common valve problems, along with means of verifying the problem has been correctly identified.

(continued)

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in the pilot system as it will give false readings and cause poor valve operation. Bleed air from the valve bonnet. Valves equipped with a position indicator will have a bleed cock on top of the indicator. Open the bleed cock slightly by turning the handle counter-clockwise. Otherwise, bleed the air from the high point of the valve. If the water runs clear, and no air bubbles are seen in the glass of the position indicator, close the bleed cock. If air is present — the water will be foamy white — run the water until the air is gone.

Strainers

Pilot systems rely on a supply of clean water, usually taken from the inlet of the valve. Either external or flush-clean type strainers can be installed. If an external strainer is installed, a simple occasional flush is a good idea. Normally, three to five seconds is sufficient time to clean the strainer screen. Experience will dictate if it needs to be flushed longer than this, but it is unlikely in a municipal system. A number of water utilities install a ball valve on the flushing plug of the strainer, allowing operators to give a short flush every time they are in the valve station. This helps eliminate problems, as a plugged strainer causes the valve to remain open.

Reducing pilot

Ensuring the control valve pilot is still operational is a simple task. As a cautionary note, before you make any pressure adjustment, make sure that this is acceptable for the system and that any SCADA alarm controls that may be triggered by a change in pressure are turned off. To exercise the pressure-reducing pilot, loosen the lock nut on the pilot adjusting screw and turn clockwise to increase the pressure 5 psi above the normal setpoint. Check that the downstream pressure gauge is tracking the adjustments you are making. Then turn the adjusting screw counter-clockwise to reduce the pressure to 5 psi below the setpoint. Does the pressure gauge track this also? Finally, turn the adjusting screw clockwise to increase the pressure back to the original setpoint and tighten the lock nut. If for some reason the pressure gauge is not moving as you adjust the screw, you either have a bad gauge or a pilot that requires attention.

Main valve flows

Just as we all like to take our cars out for an occasional run to give them a good workout, the valves also need to see some decent flow occasionally. An emergency situation, like a major fire, is not a good time to find out your main valve will not open fully. First, get some flow through the valve station to open the peak demand/fire-flow valve. This could be as simple as opening a hydrant on the outside of the valve station. If you have stations or vaults that have two valves in parallel, with one valve handling normal flow and the other valve handling large or fire flows, the larger valve should be operated for a minimum of five minutes. This can be done by closing the isolating cock on the downstream side (below the pressure-reducing pilot) of the smaller valve pilot system. This will close the smaller valve and cause the larger valve to open, allowing flow into the system. These four steps can be followed for the larger valve while it is in the flowing mode.

If you determine something is wrong, always make sure you have the correct instruction manual for the valve before beginning any repair work.

This is also a good time to ensure the mainline control isolating valves are in good working order. The gate or butterfly valves used to isolate the control valve should also be checked to ensure they are operational if they are needed.

By following this simple routine, your valves should give years of trouble-free service. Of course, variables such as pressure, operational use and water quality (hardness, TDS, etc.) all have an effect on the periods between major valve overhauls. ✦

About the Author

Mark Gimson is the marketing manager for Singer Valve. He can be reached at mgimson@singervalve.com.

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Code enforcement officer Rex Rentz checks a grease trap outside a local restaurant. (Photography by Lyle Ratliff)

FOCUS: SEWER

CUTTING OUT THE FAT

Daphne water utility builds customer relations, cuts costs and maximizes productivity

By Lisa Balcerak

In the 1990s, the Town of Daphne, Ala., had one of the state's worst environmental records. Sanitary sewer overflows were a common occurrence, resulting in expensive, time-consuming cleanup efforts and a lawsuit filed by the local district attorney. For the last six years, Daphne has transformed its sewer and water operations using a performance-driven business model that has resulted in cleaner sewer lines, satisfied customers, great cost savings and an Award of Excellence from the U.S. Environmental Protection Agency.

Rob McElroy, general manager, was brought in to turn around the Daphne utility in 2005. With his background in private sector management, McElroy changed the utility's philosophy on how to operate the organization, including better ways to work with employees and customers.

Better than "good enough"

The utility's new approach to doing business required some time for people to understand and accept. "The phrase 'good enough for government work' angers me every time I hear it because it represents waste and inefficiency," McElroy says. "We have to work hard to overcome that. There was a time when being 'good enough' might have been good enough, but that time has gone. In a downturned economy, our customers don't have the money to fund regular rate increases for what they perceive as poor service from uncaring employees and the inefficient use of the money already given to us. We want to bring more efficiency into our system, to run like a business."

The lawsuit from the DA required upgrades to the wastewater treatment and collection systems. However, the city had financial limitations because utility rates had not been raised in 10 years. Without proper

(continued)

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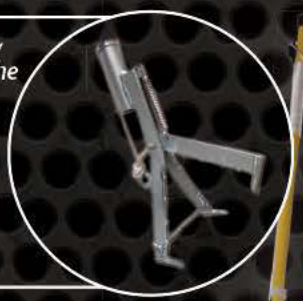

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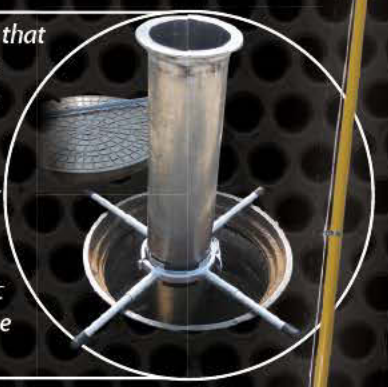

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funding, the utility struggled with an aging system installed in the 1970s. Without the funds to do proactive maintenance, they could only clean up spills after they occurred.

"We were reverting to a 'wait until it breaks' mentality. Waiting until something breaks isn't maintenance," McElroy says. "Trying to run a utility as cheaply as possible every day is the most expensive way to run in the long run. What we needed to do was figure out why the overflows were happening and stop them before they happened. That was a big paradigm shift on how to approach the problem going forward."

> **"We want all our customers to be successful because a successful business pays its water bill on time."**
>
> **Rob McElroy**

Using honey instead of vinegar

Working directly with restaurants and commercial kitchens proved to be the fastest way to reduce the frequent sewer overflows. Daphne, a bedroom community for Mobile, has only 11,000 households, but more than 100 restaurants, mostly clumped together in a region nicknamed "Hamburger Alley." It is in this area where most of the sewer blockages appeared to occur.

Instead of using a heavy-handed approach to stop restaurants from improperly disposing fats, oils and greases, Daphne hired a code enforcement officer to take a positive approach with business owners. Other utilities that McElroy spoke to said they used a harsh approach with violators, sometimes cutting off water supply until restaurants would comply. Daphne's team wanted to create partnerships with the restaurants to work positively to solve the problem. Rather than see the situation as an enforcement problem, the utility appealed to each owner's interest to protect their restaurants from sewer spills and associated costs.

"We didn't require them to install grease traps and do whatever we tell them to do. We told them that the first restaurant we want to save from a sewer spill is theirs," McElroy says. "We offered to help them find the solution that's the most cost-effective to implement, such as using paper plates or not frying as much food. We let them know that they can control what they need to do and how much it costs them."

A grease judge Stick (Earth Clean Services) allows utility employees to calculate the percentage of FOG (fat, oil and grease), solids and free water in the grease trap.

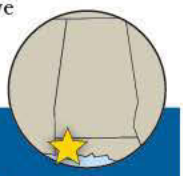
During their visits, the code enforcement officer was sometimes able to help restaurants find ways to lower costs. For example, the code enforcement officer found that several restaurants were having their grease traps pumped more often than necessary. By pumping less often and monitoring the traps, the restaurants could cut pumping costs by a half or one-third. Working with customers to lower their costs, provide good service and talk about the values the utility can offer has proven to be a good way to promote Daphne's sewer and water department.

"We extended an olive branch first to show we want them to be prosperous. We want all our customers to be successful because a successful business pays its water bill on time," McElroy says.

Good kitchen practices

Rex Rentz, code enforcement officer, targets restaurant managers for an educational program on good kitchen practices. Training sessions and a training DVD show managers the best way to handle oil and grease in commercial kitchens. He regularly checks with employees to make sure they are handling fats, oils and greases properly in their areas.

"We work with them positively and calmly, and we assume people are trying to do



Rex Rentz and commercial kitchen manager John Williams discuss the importance of minimizing the volume of FOG that is washed down the floor drain during kitchen cleaning operations.

PROFILE:
Daphne Utilities
Daphne, Ala.

POPULATION:
20,000

AREA:
14 square miles

ANNUAL RAINFALL:
64 inches

ANNUAL BUDGET:
$12 million

WEBSITE:
www.daphneutilities.com

APPRECIATING CUSTOMERS

Reminding employees of the importance of customer service has been a top priority for general manager Rob McElroy. "As utilities, we run a monopoly. When you think of yourself as a monopoly, customers cease to be seen as customers, but become people who are interrupting you," he says. "That is why we are heavily involved in customer service. We recognize that people coming in the door and paying bills need to be treated with the respect and appreciation that they deserve."

Twice a year, Daphne hosts customer appreciation days in which employees grill burgers, serve food and wash cars for customers who come to the office to pay a bill.

"I love the shocked looks from customers. I don't know another city in the country where people hang out with the utility staff, talk with them and have fun with them for a day. It builds a strong relationship with the community."

(continued)

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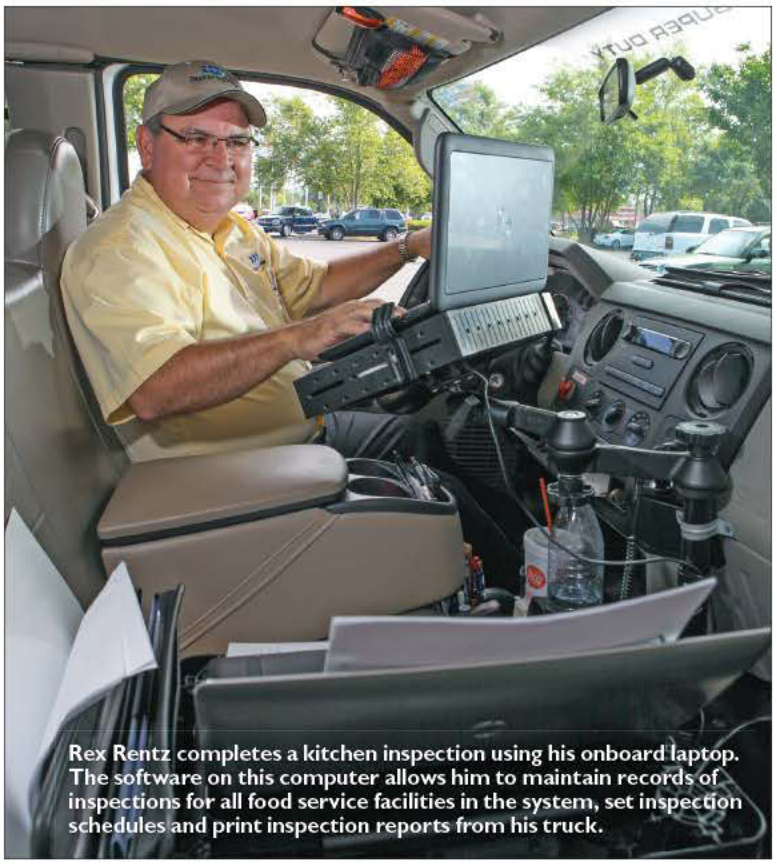
the right thing. If they aren't, we will put them under a monitoring schedule. It's just a matter of education," Rentz says. "We haven't written a fine since 2006. It's not about forced compliance, it's about building relationships. The last thing we want is for a sewer spill to happen in a restaurant and the Board of Health to shut it down. The code enforcement effort is one way we help people stay in business and keep them profitable."

11,000 teaspoons of oil

Commercial kitchens aren't the only contributors to fats, oils and grease in the sewer system. Residential customers are believed to be the biggest contributors to sewer blockages, but the utility knew it could not force a change in behavior. To motivate change, the utility wanted to show customers what they can do to help on their own terms.

As an alternative to pouring cooking oil down the sink or toilet, Daphne began a used oil recycling program in 2004. Residents can bring their cooking oil to conveniently located collection areas. Further consumer education has also contributed to reducing grease buildup in the lines. McElroy's team spoke with community groups and individuals about making small changes in the home. For example, using a paper plate to wipe off extra grease instead of rinsing it down the drain can have a beneficial impact on the sewer system.

Rob McElroy, general manager of Daphne Utilities.



Rex Rentz completes a kitchen inspection using his onboard laptop. The software on this computer allows him to maintain records of inspections for all food service facilities in the system, set inspection schedules and print inspection reports from his truck.

"If each home adds a teaspoon of grease down the sink every day, it adds up to seven 55-gallon drums of oil entering the sewer system every month," McElroy says. "If you saw someone pouring seven 55-gallon drums into a manhole, you would call the police because you'd be witnessing an environmental crime. It's the same thing."

Daphne's public outreach programs garnered a Consumer Confidence Reporting Excellence Award from the U.S. EPA in 2011.

Oil for fuel

Since starting the code enforcement outreach and oil recycling program in 2006, Daphne has seen sewer spills and grease blockages cut in half, resulting in significant cost savings. In the past, Daphne spent as much as $20,000 to $30,000 for each sewer spill cleanup at a restaurant or home. Even a simple cleanup like a manhole burping sewage onto a street could cost $5,000 to $10,000. To combat this, the utility deploys a wide range of equipment to address FOG issues in the collection system including Vactor vacuum trucks and the Sludge Judge (Nasco) to test grease traps in the field. Sewage overflows that once happened several times per month are now a rare occasion and require cleanup on a much smaller scale. The U.S. EPA recognized Daphne's efforts to limit sewer spills with a Gulf Guardian Award in 2011.

Today, the utility collects about 400 gallons of used oil each month and, in 2006, began converting this oil into biodiesel fuel. The biodiesel is used by the code enforcement truck, as well as other utility vehicles, heavy equipment and a backup generator at the wastewater treatment plant. Since the biodiesel is manufactured for only $1 per gallon, this saves the utility about $8,000 to $10,000 in fuel costs each year.

Promoting the use of biodiesel has also grabbed residents' attention and encouraged more people to participate in the oil recycling program.

Improving staff efficiency

Since there are fewer sewer overflows, there is no longer a need for a heavily staffed department to handle emergencies. In the event of a spill, the team can pull employees from other departments to aid in the cleanup. By teaming up and working together, the utility has reduced

A customer drops off used oil at one of Daphne's many grease recycling stations located around town.

GETTING ATTENTION WITH SOAP

Once Daphne began making biodiesel from recycled oil, general manager Rob McElroy's wife noted that the biodiesel processing byproduct, glycerin, could be used to make soap. The glycerin was previously thrown into the digester at the wastewater treatment plant. With 15 gallons of glycerin produced per week, Daphne started making colorful bars of glycerin soap as giveaways at public events. The soap has become one of the most effective ways of generating attention about the oil recycling program.

"No one ever goes to a street festival and gets excited to talk to the sewer plant operator," laughs McElroy. "But when I put out a pile of soaps, there's an endless line of people who want to know about it, think it's cool, and become interested in recycling their oil."

"It's not about forced compliance, it's about building relationships. The code enforcement effort is one way we help people stay in business and keep them profitable."

Rex Rentz

its staff by 14 percent over the last 5 years without a single layoff, saving more than $1 million in labor and benefits over that timeframe.

"Our motto is that we are 'One Utility.' We aren't just a bunch of people with the same logos on our shirts. We work together among the departments," McElroy says.

Cross-training between the trades has become a common occurrence in Daphne. It gives employees a chance to experience different responsibilities and learn from one another. It also prevents a single person from having sole knowledge of a critical task.

"Having a single person as the only one who can do a critical task is dangerous," McElroy says. "I don't want any critical task with only one person who knows how to do that. We constantly cross-train people."

Staff cross-training involves more than just learning a technical skill. It also can involve moving people into short-term supervisory positions so they can test out their skills and see if they enjoy it before moving back to their previous jobs. These short-term moves allow managers to figure out areas where people are best qualified so they can succeed. Plus, it's a chance for people to share knowledge across different departments, which can lead to better communication across the entire group.

"We have taken supervisors from the wastewater treatment plant and put them on a wastewater collection job, and vice versa. Both of those teams will learn something from the other. It's about sharing knowledge," McElroy says.

Turning to I&I

With sewage overflows now under control, Daphne is turning its attention to inflow and infiltration (I&I) investigation as a way to continue improving efficiency. By monitoring their Mission Communications SCADA system, combined with simple Excel spreadsheet data readouts, I&I issues have become easier to locate and address.

This effort, led by operations manager Danny Lyndall, conducts daily checks on the SCADA for 76 lift stations. Monitoring pump run times and tracking trends during rain events helps determine if there are line leakages somewhere upstream of a lift station.

"Previously, we used our lift station SCADA as just an alarm," Lyndall says. "Now we use the data to make operational determinations in the field. Reviewing pump run times, looking for trends in run times, determining if there are problems, comparing run times with rainfall data and comparing the rainfall data with the collection basins throughout the city to see if run time increases during rains."

Based on the data, the team may target field remedies such as replacing missing cleanout caps, raising manholes that become submerged in low lying areas or making other line repairs.

In spring 2012, data indicated that some of Daphne's lift stations couldn't keep up in rainfall events. Initially, the utility considered investing in larger pumps to handle the volume. However, the team changed its way of thinking and instead used I&I investigation to stop the rain from getting to the lift station in the first place. ✦

MORE INFO:

Earth Clean Services LLC
251/510-5984

Mission Communications
877/993-1911
www.123mc.com
(See ad page 33)

Nasco
800/558-9595
www.whirl-pak.com

Vactor Manufacturing
800/627-3171
www.vactor.com
(See ads pages 3 and 42)

PHOTO COURTESY OF HI-VAC CORPORATION

Firefighters approach a still-steaming vehicle after City of Orlando Streets and Drainage workers (foreground) extinguished a fire that broke out under the hood and forced the driver out.

DOUBLE DUTY

Orlando utility workers fight fire with Aquatech combo unit

By Luke Laggis

Everyone in the municipal sewer and water industry encounters an emergency situation from time to time. Usually it's a broken water main or a combined sewer overflow, something you're trained to handle. Fighting a fire, however, isn't something the typical sewer technician trains for or expects.

That didn't stop two City of Orlando workers from jumping into action when a citizen's van caught fire on a city street on June 20.

The day had barely begun for Streets and Drainage Department operators Tim Allen and Mike Wilkerson. They were just leaving their office when they noticed smoke rising from the street. When they realized a nearby vehicle was on fire, Allen dropped his cup of coffee and jumped a fence to get to his Aquatech B-15 (Hi-Vac Corp.). Orlando police were already on the scene, but firefighters had not yet arrived.

The duo quickly got their rig out into the street in an effort to lend assistance. Allen stripped the hose off the reel and brought it to the burning van while Wilkerson operated the truck's controls. They dialed down the pressure and began spraying water through the grill and between the windshield and hood. The fire was out less than two minutes later.

Rick Ehle, a project manager with Pat's Pump & Blower, the Orlando-based company that sold the B-15 to the city, said he's never come across a similar incident in his 30 years in the business.

"It's a first," Ehle said. "It was just quick thinking from those guys. I mean, they've basically got a fire truck if you think about it.

"They just did what they thought they needed to do. When they left the office they saw the smoke and there was no fire department there so they thought, 'Well, geez, let's get the truck.' So that's exactly what they did. They went out there and the police were there already but they were standing by and the driver of the vehicle was sitting on the curb watching his vehicle flame, so they just brought the hose over."

> **"They just did what they thought they needed to do. When they left the office they saw the smoke and there was no fire department there so they thought, 'Well, geez, let's get the truck.'"**
>
> **Rick Ehle**

When the fire department arrived on the scene, firefighters punched a hole through the hood of the van to make sure the fire was out, but the Streets and Drainage crew already had it under control.

"There was no fire showing, just the residual steam," Ehle said.

Allen and Wilkerson received much-deserved thanks from the police department for their unsolicited assistance. ✦

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

YOUR LEADERSHIP DNA

Taking advantage of your strengths and weaknesses will allow you to be your best

By Joelle K. Jay, Ph.D.

Can you think of a time you were really uncomfortable? Maybe it was a time you had to speak in front of a large group, or a time you had to confront a co-worker on a difficult issue. Wouldn't it be nice to make situations like that a little easier? Wouldn't it be great if you could make them less painful?

You can, and if you want to be your best as a leader, you must. When we are in uncomfortable situations, it's usually because we're acting outside of our natural way of being. When we align our natural way of being to the situations in which we find ourselves, we are happier, less stressed and more effective.

Your distinct natural attributes

You are hardwired with certain characteristics that make you distinctly, irreplaceably, inimitably you. The way you live, the way you learn, the way you lead — all of these are guided by the gifts you were given at birth and the ones you have collected in the course of your life. Knowing these attributes gives you tremendous power.

To be able to tap into your brilliance, you must answer the question, "What makes you unique?" You need to discover your distinct natural attributes — your DNA.

Your distinct natural attributes include:

- **Your strengths** — What do you do especially well? When are you at your best?
- **Your weaknesses** — What's harder for you, goes slower, or is more stressful?
- **Your personality** — What do you know to be true about yourself?
- **Your preferences** — How do you prefer to do things?
- **Your virtues** — What can you claim as being your most virtuous qualities?
- **Your vulnerabilities** — What makes you feel small and insecure?
- **Your style** — What's "your way"?

You can use your DNA to turn an ineffective situation into one in which you'll naturally succeed.

Mapping your DNA

The more strategies you use to find your distinct natural attributes, the more complete your view will be. Asking yourself the questions above will get you started. You can reveal more of your DNA by asking open-ended questions. To find strengths, ask:

1. What do you do without even thinking?
2. What do people count on you for?
3. In your social life, what role do you play?
4. At work, what are you recognized for?
5. Given the freedom to do things your way, how do you do them?

To find weaknesses, ask:

1. What activities would you gladly never have to do again?
2. What do you wish you could pass on to someone else?
3. When do you feel dragged down?
4. What do you dread?
5. When do you procrastinate?

Continue the process of exploring your DNA from every angle, getting to know yourself as much as possible.

Putting your DNA to work

Once you have a sense of your DNA, you can use your new knowledge to capitalize on your strengths.

Let's imagine three people, each with different DNA, in a similar situation. They each have to confront a colleague who is not pulling his weight on the team, and it's starting to affect both the team dynamics and the results. Notice that each of these people will handle the situation differently, based on their DNA.

Person A is shy and reserved, but very caring. She might approach this situation in a quiet one-on-one conversation in which she expresses concern for the person's feelings as she confronts the issue.

Person B is brash, direct and focused on results. He might choose his words carefully to avoid insulting the person, and then approach the situation by showing the person the disconnect between their results and their behavior.

Person C is honest and insightful, but finds it hard to have face-to-face conversations without getting flustered. He might actually write down the difficult message he has to deliver on a piece of paper and either use it as a guide to have a phone conversation or turn his notes into a letter or email to address the situation.

You can use the same approach by thinking about your DNA and understanding how it would be most effective for you to conduct yourself in any situation. Knowing your attributes gives you the opportunity to choose from among a varied collection of inner resources, dipping into them as needed for the ones that will serve you best and lead you to your goals.

Exercise

Reflect on a time in your life when you felt most powerful. What might that experience teach you about your distinct natural attributes?

Like your genetic DNA, your distinct natural attributes define "what's true about you." What's genuinely true about you — the good and the bad — is also what's great about you. ✦

About the Author

Joelle K. Jay, Ph.D. is an executive coach specializing in leadership development and the author of *The Inner Edge: The 10 Practices of Personal Leadership,* which shows leaders how to improve their effectiveness by learning to lead themselves. Her newsletter, *Inner Edge Insights,* offers articles, exercises, tips, quotes and success stories from real leaders to help you excel. To register, please www.JoelleKJay.com.

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WORTH THE COST

Quality construction inspection is an important piece of any project

By Ted DeBoda, P.E.

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

Why would a municipal utility design and bid a project that significantly reduces I&I and increases the longevity of its sewers for 80 to 100 years, but leave out the most critical element to the success of the project? It's not logical, but good construction inspection is often overlooked.

Utilities spend millions of dollars designing projects that will reduce operations and maintenance costs, eliminate SSOs, increase capacity, increase levels of service, and replace deteriorating infrastructure. When it comes to full-time construction inspection, however, they tend to skimp.

When developing a project budget, it is important to factor in at least 4 to 6 percent of the construction cost for project inspection (depending on the overall construction costs). Just as a good design is necessary for a successful project, things can go wrong when construction is not appropriately inspected.

One of NASSCO's goals is to assure the continued acceptance and growth of trenchless technologies. It is important that newer technologies are designed and installed properly so that they can have the greatest benefit to the owner. Proper installation can only be verified by having an inspector on site who is knowledgeable about the technology and willing to make sure that the contractor follows the specifications. In this way, proper inspection can encourage the spread of newer, cost-effective technologies when they are properly installed. Good contractors welcome an informed inspector who is there to make sure the project goes right, which opens up more business opportunities after the project is complete.

To accomplish this, NASSCO has established the Inspector Training and Certification Program (ITCP). To date, we have developed a two-day course for cured-in-place pipe (CIPP) installation, and another for manhole rehabilitation. These classes provide inspectors with a thorough understanding of the technologies associated with these trenchless technologies, as well as inspection and testing procedures that assure successful installation.

Just as a good design is necessary for a successful project, things can go wrong when construction is not appropriately inspected.

The CIPP ITCP started in 2007, and to date NASSCO has trained over 750 inspectors all over the U.S. and Canada. Municipalities have provided excellent feedback on this training, and many now require ITCP for inspectors who work on CIPP projects.

Manhole Rehabilitation ITCP began at the request of CIPP-trained inspectors who were being asked to inspect manhole projects. The latest class was more than three years in the making, and we are very proud to release it this year. Both classes are based on contributions from NASSCO members, many with decades of experience in their respective technologies, and have involved a significant amount of peer review from industry experts.

In our ongoing mission to set industry standards for the assessment and rehabilitation of underground pipelines, we are currently developing ITCP for pipe bursting, which we expect to release early next year. We have also established an intensive screening process for potential trainers, who must have a minimum of 10 years of experience in their respective field and be able to prove they can train the class.

NASSCO provides a variety of resources on these subjects, including performance specifications for cured-in-place pipe, manhole rehabilitation, pipe bursting and others. If you are interested in ITCP certification, or have ideas for future classes, please contact NASSCO. ✦

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

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LIFT STATIONS AND CONVEYANCE

By Briana Jones

SCADA system

The **TAC II** SCADA system from **Data Flow Systems** provides remote monitoring, control and automation solutions for wastewater and freshwater utilities. The system features user-friendly HMI software, no-cost SCADA software licenses, a plug-and-play design, ease of integration and durability in harsh environmental conditions. The unit provides a true obsolescence-proof solution and is made in the U.S. **321/259-5009; www.dataflowsys.com.**

Pump station control

The **PSL 5.0** pump station level controller from **Greyline Instruments** features redundant level sensing. It includes a non-contacting ultrasonic sensor and a loop-powered pressure sensor can be connected for redundant sensing in applications with foam or grease. The unit will recalibrate the pressure sensor automatically and switch back and forth from ultrasonic level to the pressure sensor as required.

The controller is designed for sewage lift stations, wet wells and storage tanks. Calibration and relay setpoints are easy to enter through a user-friendly keypad and menu system. An automatic pump run-time logging and reporting system helps operators plan pump maintenance and identify lazy pumps before they fail. It includes an isolated 4-20 mA output and six programmable control relays for pump control, pump alternation and level alarms. Intrinsically safe sensors and a built-in data logger are optional. **888/473-9546; www.greyline.com.**

Odor monitoring

The **OdoWatch 3.0** real-time odor monitoring system from **Kruger, a Veolia Water Solutions & Technologies Company,** helps wastewater treatment plants prevent odors before they become a problem. EPA-approved AERMOD modeling follows the odor plume over complex terrain.

Municipalities receive alerts when odors from a plant approach areas outside the predetermined parameters. Plants can then prioritize the processes that need the most attention so that upgrades can be planned. Plants can reduce the use of chemicals to dose odor sources and get more odor control by dosing only when needed. OdoSulf uses real-time, continuous views of the local impact of H_2S. **919/677-8310; www.krugerusa.com.**

Packaged lift stations

MetroRail packaged lift stations from **Metropolitan Industries** handle raw sewage, stormwater, cooling water and other applications. Control systems can be designed to include emergency backup power systems, telemetry or SCADA panels, and local and visual alarms. Other features and control options include built-in security, safe range parameters, project specific programming, flow metering, automatic or manual transfer to emergency power sources, solid-state programming and touchscreen control.

Stations are available in fiberglass, epoxy-coated steel and stainless steel. Systems can be customized in an unlimited variety of sizes with constant or variable speed control systems available. Users can combine the company's MetroFab custom-designed, prefabricated housed systems for complete package and implementation of aboveground controls. Systems can be fully assembled and ready for easy installation. Buildings can be customized with a number of exterior finishes including exposed aggregate, simulated or real brick and more. Chemical rooms and generator rooms are also available. **815/886-9200; www.metropolitanind.com.**

Pump station manager

MultiSmart from **MultiTrode** is an intelligent pump station manager that helps reduce energy consumption and operating costs. With out-of-the-box functionality designed for fast and easy deployment, the easy-to-use unit features high-quality PLCs, RTUs and pump controllers in a comprehensive, intuitive package. Preprogrammed logic prevents failures, blockages and spills. Hundreds of custom features are easily configurable for virtually any scheme or situation.

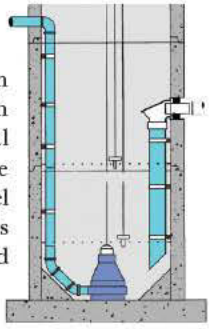
The unit provides preventive control and maintenance. It calculates pump efficiency and decreases pump station electrical consumption by leveraging use of the most efficient pump. Remote control programming reduces maintenance and troubleshooting costs, and frequency of site visits. It includes PID controls for booster pumps, and built-in local SCADA without the added cost of HMI hardware and software. Trending pump efficiency over time ensures intelligent capital improvement programs. **561/994-8090; www.multitrode.com.**

Prefab structures

Shelter-Max prefab fiberglass structures from **Orenco Systems** are an effective, affordable solution for mechanical or electrical equipment that requires protection from the elements. They can be sized to meet almost any need.

Structures are molded in a single piece (using the vacuum infusion process), and made of 4-inch foam-cored fiberglass walls, making them strong, lightweight and watertight and protecting equipment from extremes in temperature and weather. Units are approximately 7.5 feet wide by 8.5 feet high and come in standard lengths of 7, 14, 21, 28, 35 and 42 feet. Custom lengths are also available. The units are corrosion resistant and designed to withstand temperatures from -60 degrees to 125 degrees F. They are simple to set up and are transported easily by truck, rail, cargo container, helicopter or other aircraft. **800/348-9843; www.orenco.com.**

Inside drops



Lift station inside drops from **RELINER/Duran** extend pump life by preventing aerated influent from being directly drawn into the pumps. The drops can reduce pump-related problems and provide general maintenance and odor issue reduction. The drop pipe should always be extended below the low limit level and cut to follow the slope of the base fillet. If there is no fillet, users should cut the pipe at 45 degrees and maintain a distance from the floor or fillet of one pipe diameter. This will create a diffuser by directing the flow back against the structure, which de-aerates the influents. The incoming flow should not be directed toward the pumps. This arrangement has nothing to collect rags and debris and can be cleaned from above. **800/508-6001; www.reliner.com.**

Standby lift station

Enviroprime standby lift station systems from **Thompson Pump & Manufacturing** include permanently installed standby pump units that continue pumping despite power loss or primary pump failures. The automatic self-priming pump set can meet system demands during wet weather, routine maintenance, new construction or emergency repair.

The pumps include the Enviroprime system that actively prevents sewage spills. The system uses programmable electronic controls, which make use of sensors that monitor levels in the wet well and initiate backup pumping as programmed. In addition to the SCADA-capable controls that send an alarm to alert an operator, the pumps are available with the Silent Knight canopy that reduces sound levels for residential areas. **800/767-7310; www.thompsonpump.com.**

Monitoring software

VTScada 10.1 monitoring and control software from **Trihedral Engineering** allows users to quickly and easily add engaging prebuilt lift station displays to SCADA systems. The VTS Context Tag models how lift station elements relate to each other in a hierarchical structure. For example, a lift station owns a communication driver which has two pumps that each own four I/O tags. Users draw the entire context tag at once using a lift station template. The whole process takes less than a minute. The system also features preconfigured templates for third-party devices including the MultiTrode MultiSmart RTU and the MPE Pump Controller. Graphic tolls allow users to create and reuse templates. **800/463-2783; www.trihedral.com.**

Data acquisition

IntelliLogger stand-alone data acquisition and alarming instruments from **Logic Beach** can be used for pump station monitoring and alarming, remote and customer site flow totalization and reporting, energy auditing, waste treatment plant studies and more. The network-enabled units can be connected to the Internet via LAN or cellular modem. With Internet connectivity, the units can send out status or alarm emails and text messages, FTP logged data back to central servers and serve standard and user-designed custom Web pages to a browser.

The units accept analog, digital and Modbus inputs and offer I/O expansion via bus connection expansion modules. Isolated inputs, 18-bit resolution and field-configurable input types provide quick interface to most signal and sensor types. With the company's HyperWare-II software, users can quickly program the units to process input signals mathematically, totalize, perform flow calculations, recognize and output alarms, send reports and store to local memory within the unit. HyperWare-II uses icon-based, drag-and-drop programming so it is quick to learn, intuitive and included with the IntelliLogger. Models range from the low-cost, battery-powered IntelliLogger-Mini to the full Network Enabled IntelliLogger IL-80. Packaged systems are stocked and weatherproof and offer industrial frames. **619/698-3300; www.logicbeach.com.** ✦

Monitoring system prevents sewer spill

Problem

A sewer in West Covina, Calif., overflowed occasionally. Operators needed a way to monitor the level and receive alerts before spills occurred.

Solution

They installed the **SL100 sewer level monitoring system from D&D Engineering** in the pump control cabinet. The system has an ultrasonic level transmitter, data logger, cellular data modem and backup battery.

RESULT

When a power failure shut down the pumps a year later, the system emailed maintenance employees in time to dispatch a portable generator, power up the pumps, and prevent a major spill. **888/333-6474; www.sensorguys.com.**

Antenna system controls deep tunnel network

Problem

The Metropolitan Water Reclamation District of Greater Chicago, Ill., built deep tunnels connected to reservoirs to hold peak flows. Stormwater and sewage pass through valve chambers to underground drop shaft structures requiring real-time SCADA communications for flow control with sluice gates. The deep tunnel network required a foolproof method for underground wireless communications.

Solution

The district chose a **custom solution from ELAN Technologies** involving composite manhole vault covers with an integrated antenna system tuned to 479 MHz. The system's communications range was 15 miles from the repeater site.

RESULT

The system operates seamlessly, allowing wireless communications for real-time control of underground structures used for deep-tunnel SCADA. The project earned ELAN the prestigious Most Innovative Antenna System Application Award from Antenna Systems Industry. **815/463-8105; www.elantechnologies.net.**

Dewatering uses bypass pumping

Problem

A section of 54-inch sewer main collapsed near a major intersection in Albuquerque, N.M., forcing its closure. TLC Plumbing and Utility of Albuquerque worked to contain the sewage overflow, but sliplining repairs would require bypass pumping. The contractor called Griffin Dewatering.

Solution

Griffin Dewatering personnel mobilized equipment in 4.5 hours. In another seven hours, they set up the bypass and fused the pipe for the discharge line, completing it by midnight. By 3:30 a.m., they activated the pumps. When TLC Plumbing workers arrived, the area was dry enough for them to excavate entry and pulling pits and to open one traffic lane through the intersection.

The contractor then asked Griffin to install a backup bypass pump, which workers did at 6 a.m. when flows were lower. They completed the tie-in in two hours. Because flows were approaching peak capacity, they waited until 4 a.m. the following day to break through the crown of the pipe and install the suction line.

RESULT

The bypass system ran for nearly two months without incident. **800/431-1510; www.griffindewatering.com.**

Dry pit pumps handle wet-weather flows

Problem

Grit collecting in the cooling jackets of two dry pit submersible pumps at the Northeast Central Pump Station in Libertyville, Ill., created extensive maintenance problems for Lake County Department of Public Works crews. Officials also wanted to increase the station's capacity to meet wet-weather flows.

Solution

The city put out a bid for pumps with a closed-loop cooling system and selected three 268 hp **dry pit submersibles with cooling jackets and variable-frequency drives from KSB.** Each pump produces 9,700 gpm at 76 feet of total dynamic head.

RESULT

The pumps increased capacity by 30 percent while using the existing wet well and much of the original piping. They have operated trouble-free since startup in January 2012. **804/222-1818; www.ksbusa.com.**

Operating system eliminates false alarms

Problem

Up to six false alarms per day — often after hours — from the obsolete PLC/radio-based SCADA system at the Big Bear Lake (Calif.) Public Works Department began costing the city excess overtime. Besides technicians driving to the lift station to identify the alarm due to limited diagnostics, the system also suffered inadequate data collection and failure-prone communications.

Solution

The department purchased the **AquaView operating system with APP 721 controller and cellular modem technology from Flygt (Xylem).** Improved real-time control and alarm monitoring were immediate at all 12 lift stations. The system has programmable alarm sets, diverse data collection, archive recording, user-friendly displays and two-way diagnostic support via the Internet.

RESULT

Improved reliability allows technicians to enjoy undisturbed sleep. 704/409-9700; www.flygtus.com. ✦

Pump Solutions Group launches website

Pump Solutions Group launched its new website, www.psgdover.com. The site is part of PSG's "One Company-One Customer" brand image. The initiative demonstrates PSG's commitment to one common voice and image for all of its pump brands.

Parkson consolidates Middle East operations

Parkson Corp. is consolidating the operation of its Middle East group into the international division. Parkson's international group in Fort Lauderdale, Fla., will take over duties of the Dubai office. The shift allows for greater collaboration in the Middle East and elsewhere. The new unit will be led by Michael Lamminen.

Fluid Conservation Systems launches website

Fluid Conservation Systems' new website (www.fluidconservation.com) offers increased customer support and information on its line of water management and wireless monitoring systems. The site also includes detailed information on water leak detection.

FCI provides FlexSwitch brochure

The FLT93 Series FlexSwitch brochure from Fluid Components International includes product information on the precision flow/level/temperature switch for process and plant engineers.

Vacuworx adds Four Seasons to dealer network

Vacuworx added Houston-based Four Seasons Equipment to its network of equipment dealers. Four Seasons' Dallas branch will be the official Vacuworx dealer. Four Seasons also has branches in Louisiana and North Dakota.

SOR achieves IP68 submersible pressure rating

SOR Inc. achieved IP68 rating in up to 100 feet of continuous submersion for its 805PT electronic pressure transmitter. The rating ensures protection against dust and moisture.

Nu Flow receives plumbing code certification

Nu Flow received NSF International Plumbing Code (NSF-I.P. Code) certification for its cured-in-place pipe lining material.


Jeffery Givens


John Graun


Judy Bridgewater


Doug MacKenzie

Vanair names VPs, analyst, technician

Vanair named Jeffery Givens vice president of Vanair defense systems and John Graun vice president of drill and gas suppression. The company also hired Judy Bridgewater as purchasing analyst and Doug MacKenzie as service technician.

Hach Company hosting Sewer Flow Monitoring webinar

Hach Company will host a Sewer Flow Monitoring webinar led by Kevin Marsh, vice president of Hach Flow Sales, on Wednesday, Nov. 7 at 1 p.m. EST. The webinar will demonstrate how Hach's Data Delivery Services (DDS) can provide accurate sewer flow data without the hassle. Participants will learn how DDS frees staff from flowmeter installations and maintenance, how reports are easily generated from secure centralized flow data, why DDS requires no flowmeter purchase, and more. To register, log on to www.mswmag.com/hach. ✦

Product Spotlight

Vac-Con combination unit includes CUES inspection camera

By Ed Wodalski

Inspector Cam camera system from Vac-Con Inc.

The upgraded Inspector Cam camera system from Vac-Con Inc. features a CUES camera that can be mounted on any Vac-Con combination sewer cleaner for inspecting pipes before cleaning.

The camera system mounts to the hose reel and is propelled by the high-pressure water system on the machine, similar to a standard cleaning nozzle. The camera system can be retrofitted on all Vac-Con combination machines to identify obstructions or other cleaning problems, such as broken pipes, protruding laterals, off-grade pipes, offset joints, leaking joints, recessed taps, cracked pipes, corrosion, grease buildup, root infiltration, collapsed pipes, cleanouts, drain lines, service lateral vent stacks, floor drains, waterlines, internal plumbing systems and utility ducts.

"The most attractive part of the camera system is it offers a smaller inspection system at a very reasonable price," says Tom Jody, marketing manager for Vac-Con. "It allows an operator to perform some line inspections without having to bring out the camera truck and crew. I'd like to stress that it's not meant to take the place of or compete with the inspection camera systems that are on the market. It's designed to be a low-cost tool. It's kind of the little camera that can."

The camera system features a high-definition LCD color monitor (6.5 inches high by 8.5 inches wide) with sun shield, mounted on a pivot-style assembly that enables the operator to adjust to different applications. Powered by 12-volt DC or 110-volt AC, the system has a self-leveling camera head with 2.5 mm lens, 100-degree angle, preset aperture of F1.8 and high-impact sapphire window. The camera is housed in heavy-duty aluminum and factory sealed. Lighting is provided by a high-brightness, white 21-LED cluster that provides a 160-degree angle of illumination with variable settings for lighting up to 18-inch lines. Camera skids for 6-, 8- and 10-inch pipes are standard (12-inch skids available).

Other features include 600-foot video cable reel, flash board drive digital video recorder (DVR) with scan disc reader, folding keyboard and on-screen digital footage. Options include manually operated push cable reel assembly with 150 feet of cable for remote operation. The camera system can be viewed in action at **http://youtu.be/zRe3Ws6xMU0. 888/491-5762; www.vac-con.com.**

Spartan hybrid hydrojetter

The Model 740 hybrid fuel hydrojetter from Spartan Tool LLC delivers 4,000 psi at 12 gpm. Available in either gasoline-power or hybrid version that runs on liquid propane, the jetter has a wide-track, towable chassis. The LP version produces 4,000 psi. The jetter includes 350 feet of hose and 40 hp electric-start engine. **800/435-3866; www.spartantool.com.**

ABB ProcessMaster minimag flowmeter

The ProcessMaster wafer (flangeless) FEM300 minimag flowmeter from ABB's Measurement Products is available in 1/10- through 4-inch (DN3 through DN100) sizes with a Tefzel liner. Standard electrode choices include Hastelloy C, Tantalum and Platinum/Iridium. The transmitter can be integral with the sensor or remotely located. Advanced data storage within the sensor eliminates the need to match sensor and transmitter in the field. Factory-set parameters can be modified without opening the housing via the display and soft-key buttons. The unit rejects invalid entries. **800/752-0696; www.abb.com.**

Onset HOBO UX90 data logger

The matchbox-size HOBO UX90 motor on/off data logger from Onset Computer has an LCD screen for monitoring the run times of motors, pumps, compressors and other equipment. The logger records up to 340,000 equipment on/off cycle changes and uses analysis software (runs on PC or Mac) to convert recorded data into time- and date-stamped graphs. The logger attaches to motor housings via built-in magnets and without wiring. The display confirms operation, while a signal strength indicator ensures proper placement. **800/564-4377; www.onsetcomp.com.**

SubSurface PVC pipe detector

The AML PVC pipe detector from SubSurface Instruments utilizes patented microwave technology to find underground PVC pipelines in tough conditions including clay, wet soil, snow or standing water without the need for a separate transmitter, receiver or wires. Designed specifically for locating buried PVC pipes, the AML has a durable housing, LCD indicators, laser marker and sensitivity switch. **855/422-6346; www.ssilocators.com.**

HammerHead Pipe Mule leveling system

The Pipe Mule leveling system from HammerHead Trenchless Equipment has a combined lifting capacity of 240 tons. Grade and directional adjustments can be made on the fly on castings up to 84 inches in diameter. Saddle swivels keep the pipe centered during horizontal adjustments. Integrated into the saddle swivels is a friction-reducing set of plates designed to reduce overall drag. All three units of the leveling system can be operated from one control station. **800/331-6653; www.hammerheadtrenchless.com.**

Fibrelite composite trench panels

A15 load-rated 50-mm-depth trench panels from Fibrelite are available in sizes from 800 to 1,600 mm long. Made of recycled glass fibers, the covers offer a lightweight alternative to metal for access to sewage systems, underground pipework, drainage networks, electrical junction boxes, wastewater treatment plants and commercial fuel storage. The panels will not corrode and are not electrically conductive. **860/599-6081; www.fibrelite.com.**

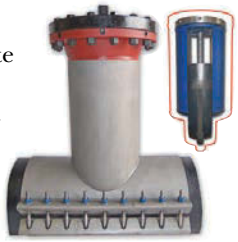
ENECON polymer composite rubber repair

FLEXICLAD ER is a two-component, 100-percent solids, trowelable polymer composite from ENECON. It is formulated to repair damaged flexible components such as conveyor belts, hoses, off-road tire sidewalls and expansion bellows. The material requires no primer and bonds to most rubber/flexible materials and cures at ambient temperatures. **888/436-3266; www.enecon.com.**

Juniper Systems handheld computer

The Mesa Rugged Notebook computer from Juniper Systems is designed for dedicated field data collection in extreme environments and features the Microsoft Windows Embedded Handheld 6.5 operating system and finger-friendly Mega Keys on-screen keyboard. The GPS function allows enabling/disabling of WAAS/SBAS corrections as well as increased GPS breadcrumb trail point size to 36,000 points. The integrated camera application enables users to emboss the image file name on the photo and to embed a user note into an image file. **435/753-1881; www.junipersys.com.** *(continued)*

Hydra-Stop 250 psi insertable valve



The 16-inch IVP 250 permanent insertable gate valve from Hydra-Stop, a division of ADS LLC, is rated for 250 psi working pressure and 375 psi test pressure. It has a 2-inch-diameter stainless steel valve stem for superior strength and reliability, interchangeable valve gate/paddle system to accommodate most types of pipe, double O-ring seal, true wedge style gate design, thrust washers, reinforced valve gate seal and loose stem nut design (aluminum bronze) for simplified operation and superior performance in severe conditions. **800/538-7867; www.hydra-stop.com.**

Universal Flow Monitors battery-powered flowmeters

Battery-powered CoolPoint Vortex Shedding flowmeters for water and low viscosity fluids from Universal Flow Monitors are designed for locations where there is no power nearby and it would be cost-prohibitive to wire the monitoring station. The meter runs on three AA alkaline (six-month lifespan) or lithium batteries (two-year lifespan) and has no moving parts to wear or clog. Flow rates or total are indicated on an LED screen. Flowmeters range in size from 1/4 to 2 inches with flow ranges from 4 to 200 gpm, maximum pressure of 300 psi and temperature from 32 degrees to 210 degrees F. **866/542-9641; www.flowmeters.com.**

Festo stormwater holding tank

The energy self-sufficient stormwater holding tank from Festo uses solar and wind energy to power the control unit and operate the pneumatic actuators, collecting excess water from the sewer system when there is a heavy rainfall. Tanks can be located in areas without a normal power supply. If the power supply from one of the energy sources fails, a built-in emergency function ensures that the gate valves continue to operate several more times until a repair or replacement has been made. Using a GSM modem, the system can be controlled and monitored from a remote control center. **631/435-0800; www.festo.com.**

Omega differential pressure transmitter

The PX5200 differential pressure transmitter from Omega Engineering is made for flow and tank level applications where reliable, low differential pressure measurements are required. The compact NEMA 4X rated unit can measure a variety of wet or dry media. Features include backlit LCD for easy reading, rotating display in 90-degree increments, stainless steel, FKM and ceramic wetted parts, flow measurement totalization/square foot extraction function, min/max and hold functions, loop check function and program lock function. **800/826-6342; www.omega.com.**

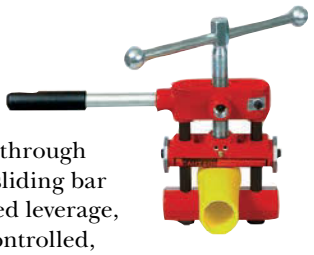
Reelcraft enclosed hose reels

Series 5000, 7000 and 8000 enclosed reels from Reelcraft Industries feature a steel enclosure that offers additional protection from potentially harmful debris. Removing the cover on either side allows access to most serviceable parts. A full flow shaft and swivel ensure hose delivery. Steel components are individually powder-coated prior to assembly. Cast guide assembly includes four nylon guide rollers to prevent hose wear. **800/444-3134; www.reelcraft.com.**

FrenchCreek full body harness series

The STRATOS Series of full body harnesses from FrenchCreek Production includes permanently affixed Strato-lite comfort shoulder/back pad and leg pads with open-celled air-mesh for breathability and moisture control. Designed to meet and exceed OSHA and ANSI standards, the harnesses are offered in vest style, construction style, cross-chest style and tower style with multiple options. **877/228-9327; www.frenchcreekproduction.com.**

Reed squeeze-off tool



The PES2 IPS/CTS PE squeeze-off tool from Reed Manufacturing is made for 1/2- through 2-inch IPS and CTS pipe. Features include sliding bar handle for work in tight spaces and increased leverage, fine-pitched thread on the feed screw for controlled, low-effort squeeze, and grease fittings at friction points for smoother operation and longer tool life. Aluminum castings withstand varied climate and soil conditions. **800/666-3691; www.reedmfgco.com.**

Accusonic transit-time flowmeter

The Model 8510 multiple-path, transit-time, backward compatible flowmeter from Accusonic Technologies is designed for challenging installations and measurement requirements associated with large pipes and channels. Measurable pipe and channel sizes range from 8 inches to 600 feet. **508/273-9600; www.accusonic.com.**

RIDGID SeeSnake Max camera system

The SeeSnake Max rM200 camera system from RIDGID combines portability and versatility for inspecting lines up to 200 feet long and 1 1/2 to 6 inches in diameter. It has a built-in docking system for attaching viewing monitors and is compatible with SeeSnake CS10 and CS1000 digital recording monitors. **800/769-7743; www.ridgid.com.**

Electric Eel Pro 2 inspection system

The Pro 2 eCAM pipeline inspection camera system from Electric Eel Mfg. features a self-leveling color camera that can negotiate 3-inch P-traps. The system includes 200 feet of Kevlar braided pushrod, 512 Hz sonde, 10.4-inch daylight readable monitor and allows for one-touch recording directly to a USB flash drive. Other features include on-screen footage counter, 2-hour battery with built-in charger, adjustable light controls, 16 pages of text writing, voice over recording and 8X zoom. **800/833-1212; www.electriceel.com.**

Endress+Hauser t-mass 150 thermal mass flowmeter

The Proline t-mass 150 thermal mass flowmeter from Endress+Hauser is designed for measuring gases, including compressed air, nitrogen, carbon dioxide and argon. The meter measures mass flow, gas temperature, free air delivery and connected volume without the need for pressure or temperature compensation. **888/363-7377; www.us.endress.com.**

Flowrox LPP-T4 hose pump

The LPP-T4 hose pump from Flowrox can pump up to 440 gpm with pressure up to 150 psi. The pump's low-friction, rolling design enables it to operate continuously in 200 degree F temperatures. **410/636-2250; www.flowrox.us.** ✦

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MISCELLANEOUS

1996 fully operational GMC P3500 grout/camera truck: Includes spare grouting equipment, packers and grouting materials. Call Lori at 717-737-6092. (P09CM10)

PIPELINE REHABILITATION

1974 International Braden: Winch truck with 3-spd. hyd, 15,000# Braden, constant speed 6, capstan head with 1,200' of 1/2' cable, articulating hyd arm. No need for top or down hole rollers. Can be used for large diameter balling, bucketing, poly liner, or pipe bursting, mounted on 1974 International Cummins diesel with 13-spd. $10,000/OBO. 916-399-9595, CA. (C11)

WANTED: Used boiler truck for CIPP lining. kenlow@theavrettcompany.com or 352-239-8550. (C10)

SERVICE/REPAIR

*****www.servicewithasmile.com*** Sewer Cam Reel and Camera Repair: Authorized for General Wire, Ratech, Vision & RIDGID. Quality service on all brands. Need more info? Give Chuck a call. Electronic Repair Co., Birmingham, AL 35206. 205-836-0454; email: part@servicewithasmile.com.** (CBM)

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SEPTIC TRUCKS

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Aries video inspection equip. for sale: 2 Badgers, (1) camera, wheels, blocks, spare parts, Satellite III, and portable easement machine with 500' cable, used once. Call 800-356-4468 or email sales@russellreid.com for photos and details. (C10)

Used and rebuilt camera kits in stock: RIDGID Mini Compact, Mini Color, Standard Self-Leveling, General Gen-Eye I, II and III, Aries Seeker, and SRECO kits. The Cable Center: 800-257-7209. (CBM)

WANTED

WATERWORKS MANAGER: N.Y. construction supply company/manufacturer looking for an energetic, experienced Waterworks Manager. Job entails, estimating, customer service, phone sales, and learning new product lines. Excellent salary, benefits, 401K, profit sharing, health insurance, life/disability insurance. Excellent opportunity! Please e-mail resume to GregF@precastconcretesales.com. Thank you for your interest! (MI-11)

WORTH NOTING

PEOPLE/AWARDS

The **City of Pensacola's Admiral Mason Park** won the Florida Stormwater Association 2012 Project Excellence Award.

Mesa Consolidated Water District of Costa Mesa, Calif., hired **Phil Lauri** as district engineer. He will manage engineering projects, plan cross connect control and direct the design, construction and inspection of the district's water system.

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 Public Works Association

The APWA has a Utilizing an Incident Command System for Public Works seminar available via audio/Web broadcast on Oct. 18.

Visit www.apwa.net.

American Society of Civil Engineers

The ASCE has these courses:

- Nov. 8-9 – Pumping Systems Design for Civil Engineers, Pittsburgh
- Nov. 15-16 – Stormwater Treatment Using Detention Ponds and Commercial Devices, Charlotte, N.C.

Visit www.asce.org.

Wisconsin

The Wisconsin Department of Natural Resources has these courses:

- Oct. 16 – Excavation "Competent Person" Safety, Madison
- Oct. 18 – Utility Management Training, Lake Hallie
- Nov. 6 – Personal Protective Equipment, Baraboo
- Dec. 4 – Permit-Required Confined Space Entry, Plover

Visit www.dnr.wi.gov.

The University of Wisconsin Department of Engineering-Professional Development has these courses:

- Oct. 8-9 – Advanced Modeling Using HEC-RAS N417, Madison
- Oct. 10-12 – Unsteady Flow Modeling Using HEC-RAS N418, Madison
- Nov. 12-13 – Using WinSLAMM v.10: Meeting Urban Stormwater Management Goals, Madison

Visit www.epdweb.engr.wisc.edu. ✦

CALENDAR

Oct. 18-20
American Society of Civil Engineers Annual Civil Engineering Conference, Montreal, Quebec, Canada. Visit www.asce.org.

Nov. 4-8
American Water Works Association Water Quality Technology Conference and Expo, Toronto, Canada. Visit www.awwa.org.

Nov. 12-15
American Water Resources Association Annual Water Resources Conference, Hyatt Regency Jacksonville Riverfront, Jacksonville, Fla. Visit www.awra.org.

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

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