



# TIGHT LITTLE PACKAGE

## Water Treatment Plant Saves Time and Money with the Right Metering Pump

By Kathryn Ranger, seepex

When Billy Branch, maintenance supervisor of the Moores Bridges Water Treatment Plant in Norfolk, Virginia, found that the hydraulic diaphragm metering pumps the plant used for producing and pumping chloramine were failing, he searched for a pump that could run consistently under high demand. In the city of Norfolk, more than 850,000 people get their water from eight reservoirs, and additional water sources include the Blackwater and Nottoway rivers, as well as four deep wells located in Suffolk. Approximately 72 million gallons of water a day are treated as pumps add sodium hypochlorite into a contact chlorine basin and then into pipes going to the filters.

### DOWN FOR THE COUNT

Several issues stood in the way of the needed level of performance to pump sodium hypochlorite, or NaOCl, in the water treatment facility. The hydraulic diaphragm pumps were having major performance issues and failing frequently. By 2009, of the original fifteen hydraulic pumps, only five were in working condition. However, consistently at least one or two pumps were down and in need of extremely labor intensive repair.

### COSTLY REPAIRS

By design, diaphragm pumps are very complex and prone to breakdown. There are many parts to this type of pump, and repair is time consuming and difficult. Required pulsation dampeners shook the pipes, causing leaks and vapor lock as well as structural damage. Repair kits cost about \$2,200 to \$2,500 each and Billy had to purchase one every six months at the rate his pumps were failing. Frequent, complicated, costly, and labor intensive repairs, wasting up to thirty hours of production time a week, were causing the plant frustrations.

The Moores Bridges Plant concluded that diaphragm pumps were much too costly, and they decided they must go in a different direction. At first, Branch had the Moores Bridges

Water Treatment Plant test hose pumps, but they proved unsuccessful. In the end, he decided to replace all of the hypochlorite diaphragm pumps with progressive cavity pumps.

### SAVINGS OVER TIME

The move to switch pumps was not made lightly, but Moores Bridges identified a way of turning a problem into a strength. Since the pump would be under a constant, high-demand



workload, Branch looked for a model with a long lifecycle to extend savings over time. Stuart Taylor, a sales engineer for Tencarva Machinery in Chesapeake, Virginia, recommended the progressive cavity metering pumps. "The seepex titanium fitted MD pumps are a tight little package," he explains. "The pump has long life and the parts are easily changed and reasonably priced. You can save time and money using these pumps." After installing the pump, operators manually adjusted the feed rate by watching chlorine levels rise and fall.

### About The Author

Kathryn Ranger is the marketing administrative assistant at seepex Inc. and can be reached at [kranger@seepex.net](mailto:kranger@seepex.net). Engineers at seepex Inc. recently were presented with the Innovative Technology Award from the Water Environment Federation (WEF). More information is available at [www.seepex.com](http://www.seepex.com).

The pump, protected from run-dry and over pressure, operated in manual mode for the trial, pumping against high pressures without pulsation or vapor lock.

After Branch's free trial run of the titanium MD 05-6LT, the plant was so impressed by the results that they committed to switching their old pumps with the seepex MD series of PC pumps. The pumps have a functional flow range of 0.05 to 2.00 gallons per minute. The pumps have a speed range of 36 to 284 revolutions per minute, have a pressure rating of 80 psig and are fitted with ½ Hp geared motors. The suction casing and the pressure branch are made of High-density Polyethylene (HDPE), which is corrosion resistant to NaOCl. The pumps' internal parts were also carefully selected to withstand the chemical. The stator is made of ethylene propylene diene monomer (EPDM) and the rotor is made of titanium.

### TIME TO UPGRADE

Coincidentally, while ordering the new pumps, their old pumps suffered a colossal breakdown for the last time. Branch called Taylor and requested to purchase the trial pump immediately and have it put in place permanently. Since then, the city of Norfolk has bought four more seepex pumps with titanium and ethylene propylene diene monomer wetted parts to replace a total of fifteen diaphragm pumps. At least two of the pumps are running at any given time, with three on standby. The pumps are alternated every ten days, and they aid with operational reliability, increase service life with optimum pump speeds, and ensure precise metered pumping of the NaOCl. They have eliminated the need for pulsation dampeners altogether. The gases present when pumping NaOCl do not affect the

performance, and it is now easier to regulate the feed of NaOCl over the entire dosing range.

### WORRY-FREE PUMPS

The new hypochlorite pump turned out to be superior to previously used models because the pumps are reliable, service friendly, and sound, which means less downtime due to repairs. The pumps offer significant cost savings, up to \$5,000 a year in repairs alone. The pumps can operate against high pressures without pulsation, will not vapor lock, and are protected from dry run and overpressure to maximize the lifecycle costs of the pump.

After switching to progressive cavity pumps for NaOCl pumping, Branch explored the possibility of using the pumps as a replacement for aqueous ammonia dosing too after lost prime would cause inaccurate dosing. Four MD 012-12 stainless steel pumps with a rate of 30 gallons per hour and four MD 025-6L stainless steel pumps with a rate of 15 gallons per hour were able to integrate into their SCADA system and deliver a precise feed rate while a sensor automatically sets their specific water levels. After successful testing, the plant's eight original ammonia pumps were replaced with the new models.

Billy Branch expressed satisfaction, saying, "We were in a real bind, and the seepex pumps saved us a lot of sleepless nights and maintenance headaches. We went from working on the pumps daily to just changing oil once a year and not having to worry about them failing. They offered us a simple product that works well. The transition between the old pumps and the new models was easy. The cost savings to the people of Norfolk was significant." ■

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*Significant Cost Savings:*  
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