

PROBLEM SOLVERS

Progressive cavity pumps gain acceptance in chemical metering applications

A West Palm Beach facility's experience paves the way for innovative and creative use for pumps

Problem: Diaphragm pumps feeding bleach during water treatment became maintenance-intensive and often required replacement.

Solution: Progressive cavity pumps offer low-maintenance, accurate, and easy-to-use solution to chemical dosing application.

Progressive cavity (PC) pumps commonly are used to move solids in wastewater treatment applications, but these pumps also are well-suited for process control in chemical-feed applications.

The City of West Palm Beach (Fla.) Water Treatment Plant operates several remote pumping and booster stations. It uses a wide variety of chemicals to produce as much as 179,031 m³/d (47.3 million gal/d) of drinking water.

When the city investigated updating its approach to chemical-feed applications, PC pumps proved to be the right tool for the job.

Maintenance becomes a burden for conventional pumps

Conventional chemical metering pumps can require heavy monitoring, frequent parts



PC metering pumps with variable frequency drives provide operators with integrated and easy-to-use control of the pumps. SEEPEX

replacement, and disposal on a regular basis. These practices can cause unplanned variances, downtime, increased cost, and water-quality concerns.

When Rick Smith, who is now maintenance supervisor at the City of



The series of PC chemical metering pump systems provide accurate metering of sodium hypochlorite (bleach) during treatment to produce drinking water. SEEPEX



Bill Martiniere, SEEPEX territory manager, inspects the progressive cavity (PC) pump system used to dose polymer during the treatment process. SEEPEX

West Palm Beach Water Treatment Plant, first started working at the facility about 10 years ago, he remembers how the diaphragm pumps began having issues when handling sodium hypochlorite, or bleach. These pumps often required maintenance on weekends for de-gassing. Backpressure valves and diaphragms always needed replacement. This was a “burdensome maintenance routine” for the operators, Smith said.

Diaphragm pumps were wired into direct-current drives with programmable logic. If a pump broke down, the drive would have to come out as well because it could

no longer communicate remotely with the control board. The city had a “trailer full” of metering pumps actively being worked on at any given time that, ultimately, needed disposal, Smith said.

PC pumps offer an edge over conventional

Smith had positive experiences with PC pumps at another facility before he started working for the city. PC pumps on a skid were able to transfer polymer from a mixing tank to a flocculation basin.

The City of West Palm Beach already was using PC pumps that required very little maintenance to handle solids.

Smith asked Poonam Kalkat, the facility manager at the time, to “give PC pumps a try for bleach,” he said. “We put them in and haven’t looked back.”

Compared to conventional chemical metering pumps, PC pumps offer such advantages as providing accurate, repeatable metering with low shear, laminar flow, minimal pulsation, and vapor lock.

The city now has four chemical metering systems equipped with SEEPEX (Enon, Ohio) PC Intelligent Metering Pumps (IMPs) with variable frequency drives (VFDs) for sodium hypochlorite applications. Three more PC IMPs pump ammonia. And 10 additional standard PC metering pumps handle polymer, caustic, ferric, and alum. The new pumps all offer easier, less-frequent maintenance.

Dosing the right amount of chemical used to be “hit and miss,” Smith said. But the PC pumps provide accurate metering for dosing alum into its stormwater treatment system. This has provided cost savings and regulatory compliance for a high-profile alternate water project.

Facility operators liked that the VFDs provide well-integrated control that is simple to use, Smith said. If the pumps’ IMPs need to be cleared, then operators can run them forward or backward. The facility is prone to power hits, Smith said. But the VFDs have not been problematic, unlike the previous direct current drives. “The IMPs with VFDs are plug and play and they can take a hit,” he said. “They just hold up.”

The city enjoys benefits of PC pump technology in unexpected ways. Smith



SEEPEX PC metering pump used to dose ferric compounds at the Florida drinking water facility. SEEPEX



PC metering pumps used sodium hydroxide (caustic) at the City of West Palm Beach Water Treatment Plant. SEEPEX



PC sludge pumps used feeding sludge to a belt press. SEEPEX

explained that his team once had trouble with polymer tanks not mixing at a dewatering press. Because a mixer was not on hand, they quickly installed a couple small PC pumps to recirculate the 6-m-tall (20-ft-tall) tanks. With any other pump, this would not have been possible, but the PC pumps successfully operated as mixers in this installation.

The city also used PC pumps in a wet, outdoor environment for more than 1 year to dose low levels of chlorine to raw water feed lines for algae control. And it received regulatory approval to use PC pumps at remote booster stations as part of a project to replace the use of chlorine gas with liquid bleach. ■

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