Water Treatment Plant Standardizes on One Pump Model to Reduce Costs

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SUBJECT: *St. Helens, Oregon, Wastewater Treatment Plant and Water Filtration Facility*

WASTEWATER TREATMENT PLANT

The City of St. Helens Wastewater Treatment Plant consists of two lagoons, an operations building, a chlorine building and a shop. The facility treats all the domestic waste from both St. Helens and Columbia City, Oregon. In addition, the facility treats waste from a number of local industries.

There are four employees at the plant, a Water Quality Manager, two Water Quality Operators, and a Pretreatment Program Coordinator. Along with the Treatment Plant, the operators also operate the Water Filtration Facility and maintain nine sewer lift stations throughout town.

The Application

The treatment process consists of two lagoons. When waste enters the plant, it is screened and enters the smaller 3-acre lagoon for primary treatment. After primary treatment, it is disinfected and flows into the larger 40-acre lagoon. Once in the 40-acre lagoon it mixes with the waste from the Cascades Tissue Mill. After the secondary treatment, it is discharged into the Columbia River.

The Problem

The wastewater plant experiences sporadic flows averaging a million gallons per day, but flows can fluctuate greatly and the chemical feed pump in use should be able to meet varying chemical dosing requirements.

The plant was using two diaphragm metering pumps to deliver Sodium Hypochlorite at pressures of 10 to 12PSI, and there were several ongoing issues. The diaphragm pumps were experiencing near continuous leaks, and required ongoing maintenance due to parts failure. The pumps needed to be completely rebuilt every four to five months.

These maintenance issues necessitated the facility keeping a large inventory of replacement parts, and also resulted in excessive downtime and operator hours spent on repairs.

WATER FILTRATION FACILITY

The City's Water Filtration Facility has the capacity to treat up to 6 million gallons of potable water per day using membrane filtration. The water is pumped from Ranney wells located on the Columbia River to the plant for treatment before entering the distribution system.

The Application

The Water is chlorinated prior to entering the raw water tank, ahead of the filters. This allows longer contact times and prevents premature fouling of the filters.

The Problem

The pumps that were originally installed were vastly oversized for the flow. The diaphragm pumps were also difficult to adjust and resulted in swings in the chlorine residual. Another issue that operators faced was the location of the pumps. The design had the pumps located 150 feet from the injection point with the chemical lines running overhead.

The Solution

With approval to upgrade the system, the search began for a pump that could meet both plants broad range of dosing requirements, would provide ease of operation and reduce the amount of spare parts needed on the shelf. The goal is to eventually replace all chemical feed pumps in use and standardize on one model of chemical feed pump.

The City of St. Helens found the pump to meet all their chemical feed requirements with the FLEXFLO® M3 Peristaltic Metering Pump, which is manufactured by Blue-White® Industries.

Benefits of the FLEXFLO® M3 include a broad feed range of .0002 - 33.3 GPH (.0007 – 126 LPH) with a turn down ratio of 10,000:1.

The M3 features an intuitive, icon-based touch screen control that's as simple to operate as a cell phone. IP rated M12 connection ports protect against moisture, dust, vibration, and any temperature change.

M3 remote control signal options include Pulse, 4-20mA, Modbus TCP, EtherNet IP, and PROFIBUS for enhanced supervision and automation for critical metering and transfer applications.

St. Helens Water Quality Manager, Aaron Kunders, stated, "We've been the most surprised by how little maintenance these pumps require. We haven't done any maintenance or any repairs, not even a pump tube change, during these first seven months of operation." Kunders went on to say the M3s were simple to install and set up, and operators appreciate the ease of operation, reliability and the uniformity that comes from standardizing on one pump.