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Military Base Water Treatment Plant Installs Dual Diaphragm Pump

Application:

Marine Corps Base Camp Pendleton is the major West Coast base of the United States Marine Corps. It is located on the Southern California coast in San Diego County. The Camp maintains a self-sustaining water supply and sewage treatment plant to serve a population of 70,000.

Problem:

Camp Pendleton has been using four single diaphragm metering pumps to inject sodium hypochlorite into their potable water as both pre and post-chlorination of the bases' drinking water.

The diaphragm pumping cycle consists of a suction and discharge phase. During the suction phase of the cycle, gas-forming chemicals like sodium hypochlorite can cause vapor lock and the pump may lose prime.

Priming was a challenge for the diaphragm metering pumps that had been in use because this application required intermittent pumping through duty and standby metering pumps.

Another problem that presented itself with the diaphragm pumps in use was the expense of repairs and downtime. The repair kit was quite costly (averaging around \$1200 per kit), and the pump required a full day to repair. In addition, the repair work was complicated and messy.

Solution:

The diaphragm pumps in use at the facility were replaced with two



of Blue-White Industries CHEM-FEED® MD3 Multi-diaphragm metering pumps for beta testing. The dual-diaphragm configuration of the MD3 and the pumps' exclusive hyperdrive technology provides smooth continuous flow, mimicking the best traits of peristaltic pumps but with no tube to change.

With Hyper Drive Technology, when the MD3's first diaphragm is in the suction phase, the second diaphragm is in the

discharge phase. This causes gaseous fluids to be pumped through the head with virtually no chance of vapor lock or loss of prime.

The CHEM-FEED MD3 has an excellent turndown ratio of 2000:1 and provides smooth chemical dosing with no pulsation dampener required. With 380 strokes per minute the CHEM-FEED® MD3 provides a remarkably steady flow. In addition, MD3 is fitted with Blue-White's exclusive, patented DiaFlex® diaphragm which is designed to provide long service life.

Sean Donegan, Water Treatment Specialist of ACEPEX, stated that "the MD3 pumps have a smooth consistent flow, like peristaltic pumps, especially at low feeds."

Donegan also stated that "the MD3 pumps are less expensive than other pumps, especially when comparing spare parts cost and time to repair." The only wearable parts on the hybrid pump are the cartridge check valves and diaphragms.



Figure 1. CHEM-FEED® MD3 Multi-diaphragm Metering Pump.

Result:

The MD3 succeeded in pumping the gas-forming chemical in the high pressure application and eliminated issues with vapor lock. The pumps injected 12.5 to 16% of sodium hypochlorite at the rate of 5-7GPH at 80-120 PSI. The MD3 pumps maintained an accurate and continuous flow, providing smooth chemical dosing and eliminating the need for a pulsation dampener.

MD3 has a large 5" display screen for easy viewing and simple operation of the intuitive touchscreen controls that have easily recognizable icons and is as simple to operated as a smart phone. Advanced communication protocols include 4-20mA, Pulse inputs, Industrial Protocols, and Remote



Figure 2. DiaFlex® PVDF diaphragms.

Start/Stop. MD3 is Built for long-term service with new software capabilities that will roll out in future firmware updates, and will be field upgradable.

Installation and setup were greatly simplified because of the pumps drop in place design and built-in controls. Sean believes the installation is made even easier because, “the wiring is simple with the labeled terminal blocks.”

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