

Case study: Illinois, United States

CENetic water pumping system overcame water hammering conditions, became new standard

The operator of a chemical plant in Illinois that uses potable water from seven on-site water wells in its processes was experiencing premature water pumping system failures when changes were made to the facility's operating parameters. When valves were shut while the pumps were operating, the water production was hitting the closed valve and then reversing on to the top of the pump at a high rate of velocity.

The greater thrust load in the pumping systems from this water hammering effect caused motor overheating and failures in the traditional water pumping systems, which carry the thrust load in the motor. Expected pumping system run life at the plant is five to seven years, but due to the water hammering issue, the pumps were failing in less than one year.

The operator turned to Baker Hughes for a pumping solution that could withstand the water hammering conditions. Baker Hughes application engineers recommended a **CENetic™ certified water pumping system** featuring a 9-in. nickel aluminum bronze bolted-bowl pump, a seal section with a high-thrust load bearing, and the industry's only epoxy encapsulated motor.

Unlike traditional water pumping systems that carry all of the thrust load in the motor, the Baker Hughes design incorporates a separate seal section to isolate the majority of the thrust load from the motor, and to provide redundant mechanisms to prevent fluid ingress into the motor. The seal and motor combination can handle a net 23,000 lbf.

At the time of publication, the first CENetic pumping system has been operating flawlessly for more than a year and a half while existing traditional water pumping systems continued to fail in less than a year.

Based on the performance of the Baker Hughes system, the operator has standardized on this superior technology for all of the plant's water wells going forward.

Challenges

- Changes to chemical plant operations caused water hammering conditions in downhole pumps
- Premature failures of traditional water pumping systems due to water hammering

Results

- Increased run life of water pumping systems
- Standardized on CENetic water systems for all the plant's water wells