

MPW's Jacket Water Cleaning Reveals Hidden Threat

Problem

A Midwest natural gas compressor station faced a challenging situation when plant personnel discovered extremely low levels of corrosion inhibitor in the engines' cooling systems. pH levels were exceeding maximum recommendation for the system, likely due to excessive fluid degradation. The protective properties of the inhibitors in the previous coolant had been depleted, resulting in years of contamination. Levels indicated a need to change and upgrade the heat transfer fluid in several of the engine cooling, jacket water systems.

The systems for the four units consisted of a complex array of aftercoolers, oil coolers, surge tanks, rundown tanks and over 1.5 miles of piping, ranging from 2" to 8" diameter. Coolant capacities for all systems totaled approximately 27,000 gallons. The compressor station operates as a standby and peak loading compressor station, which can be called into service at any time.

It was imperative that the compressor station correct the problem immediately. The station needed to be ready to provide supplemental or replacement compression on-demand to keep gas flowing through the pipeline network. Due to years of application expertise, plant personnel didn't hesitate to contact MPW to chemically clean the jacket water systems and install new coolant. The process would include draining of exhausted fluids, filtration, flushing and refilling the system with glycol.



MPW technical support delivers over 125 years combined operations and applications expertise to effectively clean glycol cooling loops and jacket water systems. MPW manages all aspects of draining, filtration, flushing and refilling. Chemical and mechanical cleaning methods ensure that unit life expectancy is increased, heat transfer is improved and flow is restored.

" MPW's highly experienced cleaning process allowed us to be ready to provide supplemental or replacement compression capacity."

- Area Supervisor

MPW Solution

MPW's team of chemical cleaning specialists and Dow Chemical representatives met with plant engineering personnel to determine a solution. Detailed equipment lists and estimated water and glycol capacities were supplied to ensure effective cleaning and glycol replacement. MPW estimated a two-week cleaning and refilling schedule based on the scope provided. MPW personnel drained the jacket water systems of exhausted fluid into temporary holding tanks, scheduled for disposal. Proprietary pumping equipment was mobilized to transport Dow cleaners and degreasers through the cooling systems, removing sludge and scale formed by the breakdown of glycol and fluid additives. By combining degreasing and descaling processes into a single step, a broader spectrum of foulant removing capabilities are presented, resulting in a shorter application cycle. MPW partnered with Dow Chemical to provide specialty chemical agents that provided maximum cleaning efficiency while minimizing waste generation.

To sustain high-purity water demand, MPW's mobile DI units were used to recycle water during the rinse stages until the system tested clean. After completing the cleaning phase, MPW installed approximately 27,000 gallons of 40% Norkool™ SLH Inhibited Ethylene Glycol-based coolant and 60% deionized water, to provide long-term protection against corrosion and scale formation.

Weld-a-Lets were installed to gain access to clean underground low points. MPW pumped Norkool™ cleaners, degreasers and inhibitors through the process pipelines to remove heavy build-up of solids and contaminants that accumulate, as there is little fluid motion to keep them suspended.



Solubility studies are conducted utilizing various chemical formulations. MPW's fleet of mobile jobsite laboratories are built in-house to provide rapid, highly accurate chemical analyses.

Results

MPW cleaned the system and achieved plant objectives within the two-week timeframe. The combined efforts of MPW personnel and Dow Norkool™ product's performance, ensure that the compressor station stands ready to provide emergency service and long-term protection requirements.

In addition to cleaning and refilling the system, MPW uncovered a hidden threat during the final inspection. Sources of potential leaks that previously went undetected during operation and engine idling were discovered in critical cast components of the jacket water systems. Years of accumulated corrosion within the cooling systems prevented leakage; however, the rust removal during the cleaning process exposed a path for effluent to escape. The findings were immediately brought to the attention of plant operations. Although the plant experienced emergence in two areas as a result of the corrosion removal, it was a fortunate incident. Plant personnel stated that if the system hadn't leaked during cleaning procedures, it could have malfunctioned some time in the future when the facility was called upon in an emergency situation or active service. By detecting the leaks early, plant personnel were able to make repairs as part of their scheduled maintenance project.