

DuPont™ Vespel® CR-6100

Pipeline Pump Components Boost Efficiency, Reliability and Safety.

Application

The operator of a pipeline in the Southwestern U.S. was searching for a case ring material for pumps that would enable improved operating efficiency, increase equipment reliability and avoid the seizing or galling problems encountered with metal components.

The pumps were nine-stage horizontally split units made by Sulzer Bingham. The process fluid consisted of natural gas liquids (NGL) at ambient temperature.

Challenges

Tighter clearance. Reducing clearance between the case ring and the hard metal surface of the impeller is a proven method of increasing pump efficiency, but it would increase the frequency of contact between the case ring and impeller.

Process upsets. Survival of case rings under run-dry conditions caused by process upsets is highly desirable.

Solution

Vespel® CR-6100 parts. The operator replaced metal components with Vespel® CR-6100 parts for nine case wear rings along with center, throat and throttle bushings in one of its pumps. Clearance between the case rings and impeller OD was just 0.010 inch (254 µm), about half the API-specified clearance for metal components in such pumps.

Benefits

Higher efficiency. The operator measured a 3% gain in pump efficiency over the pump manufacturer's performance test curve.

Run-dry survival. Shortly after installation of the Vespel® CR-6100 parts, a control problem caused the pump to run "blocked-in" with both suction and discharge valves closed for 38 minutes. After the pump was shut down and cooled, operators were surprised that the rotor still turned freely. They then replaced mechanical seals, checked alignment, and returned the pump to normal operation.

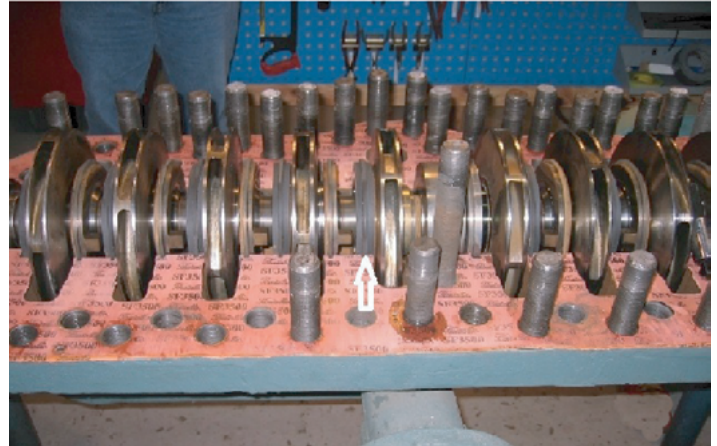


Photo source: Boulden Company, Inc.

Vespel® CR-6100 parts (arrow) survived under run-dry conditions

Increased safety. The operator reported that the continued operation of Vespel® CR-6100 parts during the process upset helped significantly in avoiding a release of hazardous material.

Long life. The pump continued in operation for the next six months, completing its planned production cycle. During this time, there was no noticeable change in pump vibration or efficiency. At the end of the cycle, the pump was disassembled to inspect the rotor (see photo). The Vespel® CR-6100 parts had survived the incident with no measurable wear, and there was no damage to the pump rotor.

Extending the benefits. Based on the proven 3% efficiency gain and run-dry capability of Vespel® CR-6100 parts in this particular situation, the operating company installed CR-6100 parts in the pipeline's eight additional pumps.

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