

CIRCOR DELIVERS MULTIFACETED SOLUTION TO VENEZUELAN FACILITY



CHALLENGE

Moving heavy, sand-laden crude oil through its pipelines had always been a tough challenge for a large oil producer located in Venezuela. Because of high levels of basic sediment and water (BSW) in the crude oil, the company's mainline transfer pumps would gradually lose capacity and require rebuilding every three to four months. These frequent, major repairs resulted in costly downtime, and the company tasked its reliability engineers with finding a solution.

SOLUTION

The company knew that meeting today's petroleum demands required transporting more challenging crude oil, and it needed a new source of pumps for this difficult application. But it also understood that a sound solution demanded more than merely the right equipment; it required engineering expertise, comprehensive testing capabilities and a strong local support network. Exactly the combination of strengths that CIRCOR's engineers could provide.

RESULTS

CIRCOR replaced a competitor's twin-screw pumps with new Warren® twin-screw units, which have proven to last up to six times longer than the former models – averaging from 18 to 24 months between repairs in the harsh operating conditions. That performance has helped cut downtime dramatically and provided an equally significant increase in bottom-line results. In the first five years of operation, spare-parts savings exceeded \$2 million – and that's without calculating the cost of maintenance labor and lost flow.

PUMPING NEW LEVELS OF PRODUCTIVITY – AND PROFITS

As a major crude oil producer, the customer faced the difficult task of moving a blend of heavy Boscan crude oil, which has 30 percent water, 30 percent gas and significant amounts of sand, into its pipelines at its Venezuela facility. The company's pumps were operating under conditions that included 415 pounds per square inch (psi), 3,500 to 18,000 centipoises (cP) and a flow rate of 1,400 gallons per minute (gpm). And the five pumps at this station combined to move more than 180,000 barrels per day (BPD), with 25 percent gas content, through the facility.

STRONG LOCAL TIES FOR A SOLID SOLUTION

Because of its strong local support and technical expertise, CIRCOR was chosen to develop a more effective solution. Specifically CIRCOR was awarded the opportunity to meet the customer's challenges because of the combined engineering expertise of its Warren, Imo® and Houttuin™ product lines. That expertise included an average of 25 years of experience in positive displacement pumps by application and field-service engineers. It also included real-world application and design-analysis experience.

Working through its local representative, CIRCOR was able to gather crucial information and insight into the plant's operations. The customer's project engineer was then brought in to work with CIRCOR engineers, to assess production and testing capabilities. In fact, the design, quality and testing specifications were all jointly developed before the order was ever submitted.

THE RIGHT PUMP FOR THE JOB

The pump that CIRCOR selected was a Warren GTS-H268 model, with components designed specifically to meet the challenges presented by the application: to ensure optimal performance and service life. The pump included hard internal coatings, double angular roller bearings, mechanical seal lubrication and a lube oil-level switch. It was also designed with a replaceable cartridge, which allowed for quick repair and minimal downtime.



The new CIRCOR pumps have cut downtime dramatically and provided an equally significant increase in bottom-line results.

“CIRCOR manufactures a wide variety of pumps. We recommended the Warren GTS-H268 option, because we knew that the customer needed less downtime for its pipeline,” said Mark Korzec, director of CIRCOR crude oil sales development. “Each installation has different requirements, and our goal at CIRCOR is to tailor the right solution to the customer’s need.”

CIRCO THINKS OUTSIDE THE PUMP

Selecting the right pump for the application was merely one step of the comprehensive CIRCOR solution. While the pump’s performance was certainly vital to the customer’s application, it was the array of readily available support and service programs that made the installation so successful.

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Having a local sales team ensured that technical services and troubleshooting help were always close by. Plus, because the CIRCOR team was always thinking beyond mere equipment, the customer was provided with a turnkey solution that included everything from project management and training programs to the actual skids, drivers, sensors, controls, lube systems and American Petroleum Institute (API) seal plans that the application called for.

Additionally, the CIRCOR network of engineers and field technicians supported the customer with follow-up calls and frequent checkups to ensure that customer expectations were met.

TESTS, TESTS AND MORE TESTS

CIRCOR’s support didn’t end once the pumps were shipped. In fact, as soon as the order was entered, CIRCOR called in third-party inspections to ensure compliance to the customer’s requirements. As part of that effort, a special test stand was created specifically for this project, and a project engineer observed several days of testing at field operating conditions.

Testing of the new pump solution was conducted in accordance with API 676 and Hydraulic Institute standards. Per the customer’s requirements, a series of special tests was completed, including string tests and hydrostatic, performance, vibration, noise and NPSH examinations. In addition, studies were held on a variety of test viscosities, such as water, fuel oils and lube oils, as well as for high-temperature and shear sensitivity.

THE RESULTS KEEP FLOWING

The new pumps installed at the Venezuela plant have been performing up to two full years without major maintenance breakdowns. That compares favorably to the as-little-as-three-month periods for which the old pumps operated. Today the CIRCOR solution enables the customer to pump more than 180,000 BPD from the flow station. Just as important, the solution has reduced pump-related downtime by approximately 75 percent and significantly cut field labor costs.