CASE STUDY

RE-ENGINEERING OF THIRD PARTY PUMPS IMPROVES EFFICIENCY

- Laser scanning and re-engineered components
- Increased efficiency and improved MTBF
- Spare parts availability reinstated

CHALLENGE
The customer wanted to minimize downtime associated with its third party four-stage barrel pumps. The original equipment manufacturer was no longer in business, but the existing impellers and diffusers were in urgent need of repair or replacement.
SOLUTION

Using state-of-the-art, non-contact, laser technology, Celeros Flow Technology was able to obtain highly accurate scan data of the damaged impeller and diffuser parts. The pumps exhibited signs of wear that were caused by inherent design flaws and our Aftermarket Services team sought ways of eliminating these fundamental design issues as part of the pump overhaul.

For example, the original impeller assembly was slip fitted and held in place with a single nut. The rotor had to be disassembled in order to reassemble the complete pump, making it virtually impossible to duplicate the runouts and balance. The balance piston also had a tendency to come loose if the shaft nut was not properly tightened. These factors can lead to excessive runouts and a bowed shaft due to the faces and bores of all components not being exactly square and true.

The Celeros FT solution has impellers that shrink fit to the shaft, reducing the likelihood of the impeller working loose or making the shaft bow. The new shaft design also makes assembly and disassembly of the rotor and pump easier.

OUTCOMES

Thanks to our inhouse engineering expertise, we have been able to improve the suction characteristics to reduce cavitation damage and increase overall efficiency. The use of stronger and more corrosion-resistant materials has also improved the service life of the components, which also improves the overall Mean Time Between Failures (MTBF).

With 3D computer models and all the data for the pumps and parts recorded accurately, it will be easy for Celeros FT to supply the customer with spare parts in the future, extending pump life and making servicing and maintenance simpler.