

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.



Damaged impeller



**CLYDEUNION®**  
PUMPS

Industry: Oil & Gas - downstream

Region: Americas

Category: Re-engineering

API Type: BB5

## 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.

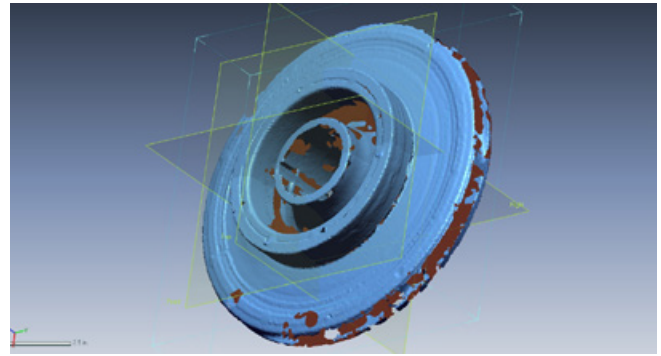
For example, the original impeller assembly was slip fitted and held in place with a single nut. The rotor had to be disassembled in order to reassemble the complete pump, making it virtually impossible to duplicate the runouts and balance. The balance piston also had a tendency to come loose if the 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.

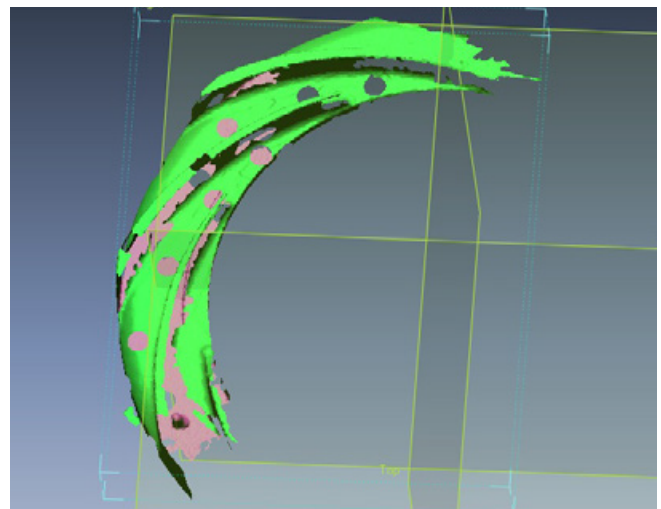
## OUTCOMES

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.



3D scan of damaged impeller



3D scan of damaged diffuser

Aberdeen Service Center  
P: +44 1224 756 100

Abu Dhabi Service Center  
P: +971 02 4081900

Anney Service Center  
P: +49 405 220 2401

Baton Rouge Service Center  
P: +1 225 778 3310

Battle Creek Service Center  
P: +1 269 966 4782

Burlington Service Center  
P: +1 905 315 3813

Calgary Service Center  
P: +1 800 352 8294

Corpus Christi Center  
P: +1 361 371 6519

Downey Service Center  
P: +1 562 622 2371

Glasgow Service Center  
P: +44 141 637 7141

Jenks Service Center  
P: +1 281 217 6359

Odessa Service Center  
P: +1 704 808 3780

Penistone Service Center  
P: +44 1226 763 311

Singapore Service Center  
P: +65 6513 9276

Zhengzhou Service Center  
P: +86 371 8665 2391

E: [cu.sales@celerosft.com](mailto:cu.sales@celerosft.com)  
[www.celerosft.com](http://www.celerosft.com)



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