



Rotating Equipment Specialists

AN OVATION HOLDINGS COMPANY

CASE STUDY

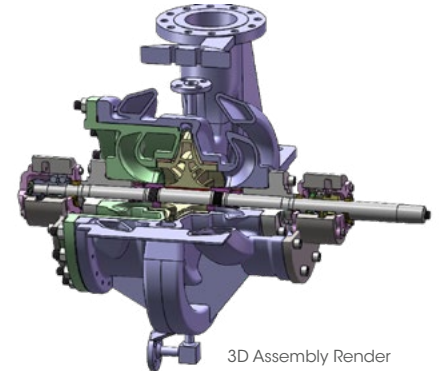
Industry: Refinery

Improve Pump Reliability Through 3D Scanning and CFD

Conhagen was brought in to custom design a pump to replace an antiquated high-maintenance coker charge pump.



Complete Assembly



3D Assembly Render

Objective

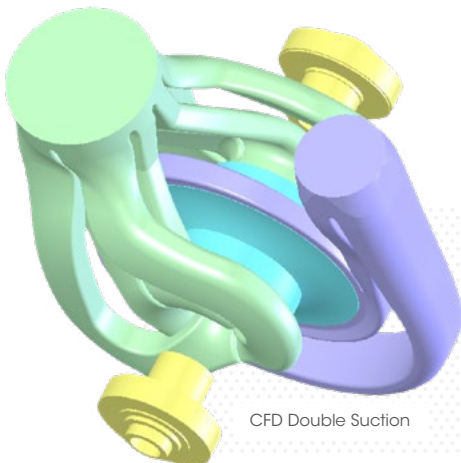
Provide a more reliable, low-maintenance pumping solution for a critical Coker charge application. The existing centrifugal split case radial pump has a history of high vibration, and short bearing/seal life.

Solution

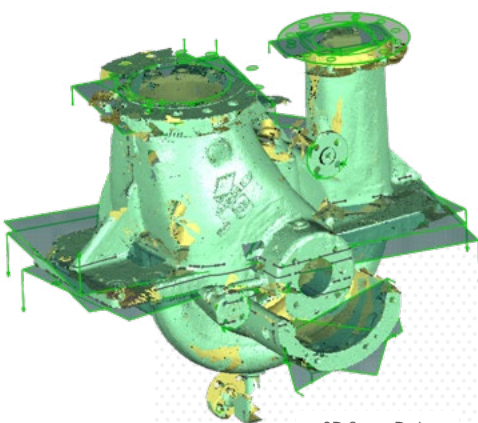
To develop a thorough understanding of the existing pump and position Conhagen with the ability to propose a solution that would require minimal reconfiguration and reuse existing elements, an extensive 3D laser scan and modeling of the existing pump was performed. Faro Arm Edge and 3D Systems' Wrap were used to develop extremely accurate as-is 3D scans of the existing pump. Engineering quickly determined that the large distance between the primary shaft bearings was a major contributor to the vibration and bearing/seal life problem. The solution would include reducing the shaft span between bearings and improving the flow characteristics.

The new design moved the seal housing and bearings closer to the impeller. The impeller, bearing housing and mechanical seals were reused. The shaft was extended outside of the casing to allow for the reuse of the coupling hub and spacer.

The new pump was manufactured and installed by Conhagen. Conhagen was onsite to support the start up and the new pump.



CFD Double Suction



3D Scan Data

Results

The new pump was manufactured and hydrotested by Conhagen.

A highly reliable coker charge pump was designed and manufactured while reutilizing the existing foundation and piping.