

Refinery Solves Vintage Pump Replacement Application with “Drop-In” Replacement Pump

Leonard Cadena, P.E., Technical Sales Manager, PRO Services, ITT Industrial Products Group PRO Services® Project Engineers work with customers and PRO Services Centers to solve our customers pumping problems by analyzing pumping systems and providing turnkey solutions that make commercial sense.

CUSTOMER PROBLEM:

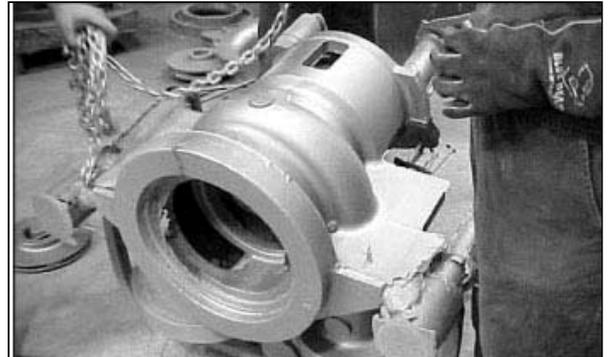
A central states refinery was experiencing excessive reliability and maintenance costs on two 6x8-10 Double Suction Between Bearing Fractionator Reflux pumps due to them mainly being worn out after 35 years of difficult service in non-current API metallurgy. The pumps hydraulic requirements had not changed with 950 GPM at 366 TDH. The OEM had retired the castings already, eliminating in kind parts, so the customer was ready to replace the pumps complete with current API designs. However, the cost of replacing the foundation and piping was substantial and these aspects of the installation were both in good shape. Hence, they were interested in looking into the option of a complete “drop-in” replacement pump.

ITT SOLUTION:

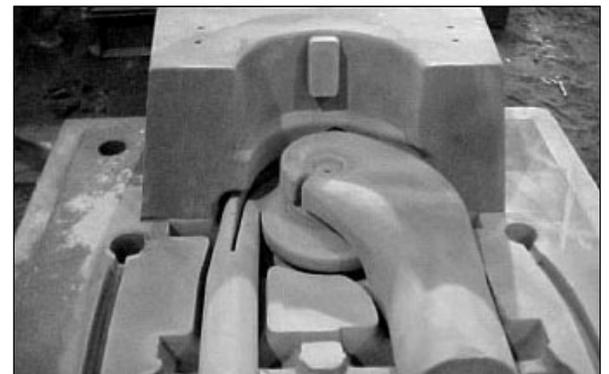
To properly address this pump replacement we had to first review the exact hydraulic requirements of the pumping system as it currently existed. The review showed no significant hydraulic changes so sizing was consistent with what was there. The drop in replacement pump option saved the customer significant expense in both time and money. By providing a replacement pump there would be only a couple of days down time on each pump and the reliability of an API 8th Edition pump vs. a 5th Edition pump was significant relative to the seal life expectations.

PRO Services Engineering staff went to the field and dimensioned all parameters of the pump. The outline drawing shows dimensions of the flanges vs. the anchor bolts and overall lengths which is required for construction. To develop new case patterns and castings the engineer must know the location of the casing feet and bolt holes relative to the suction and discharge flanges. This was accomplished using special laser coordinate measuring devices. With this information and utilizing standard Goulds API 3620 between bearing hydraulics, the engineer was able to design the external features of the pump to fit the existing base and piping while still utilizing proven hydraulics.

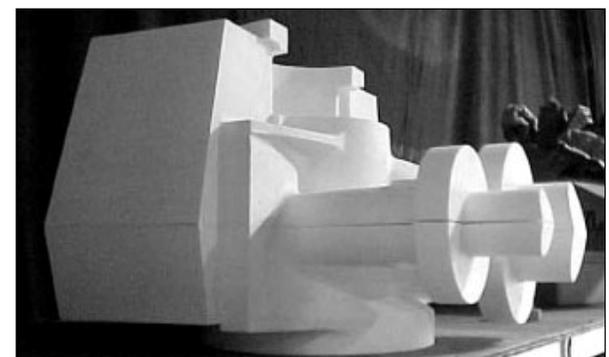
Once designed, all components except the case were standard from inventory. The case would require a pattern for this special application.



Casting Completed



Sand Casting Preparation



Lost Foam Pattern Production



To reduce cost and leadtime PRO Services utilized our Lost Pattern Foam Process. With the advancement of CNC machining and three dimensional modeling PRO Services "ProCast" division was able to produce single-use patterns in days with foam vs. weeks for wood type patterns with this process. Sand castings were made from these foam patterns. Then utilizing our foundry we poured the finished product.

THE BOTTOM LINE:

Commercially this allowed the customer to spend about 45 cents on the dollar versus the total replacement of the pump with a new unit. The 45 cents included the removal of the pump by our personnel, the pump, reinstallation of the pump by our personnel and all software associated with the job. The complete process took less than 14 weeks from order to shipment. To see a complete presentation on this process of Complete Drop In Replacement Pumps or to explore a drop in pump replacement opportunity on another pump, please contact your local PRO Services Center or Service Representative.