Solids Handling Vertical Turbine Pump Increases MTBF in Mining Suspended Solids Fluid Application

By David Aldrich, Product Manager at Floway

The Challenge

A copper mine in Chile had a quantity of six standard 24-inch two-stage 900 HP vertical turbine pump (VTP) units installed on intake structures in a process water application in their reclaimed pond system. As the concentrator plant's tonnage increased, the fluid began reaching the pond with a high concentration of solids, resulting in premature damage to the pump units and a shortened life of roughly 300 hours. The pump failures were also causing operational disruptions as they required frequent maintenance and increased the customer's operating costs.

The wear parts of the VTP, such as the sleeve bearings, impeller/bowl wear rings, mechanical seal/packing and impellers, are typically the most susceptible to the wear caused by applications with a higher concentration of suspended solids. This is why most VTP manufacturers only guarantee performance with a maximum solids concentration of 1-3% by weight.

The Solution

To increase pump life, and decrease maintenance downtimes, the customer installed Floway's Vertical Turbine Solids Handling Pump (VTSP). This pump will pump fluids with solids concentrations up to 10% by weight, with peaks as high as 20% by weight. The VTSP includes a patented sealed-for-life bearing which requires no external flush. It also includes a slurry type seal with a throat mounted isolation device, which prevents the need for external flushing of the seal faces. Other wear parts and areas such as the impellers and bearing journals, are offered in hardened materials for optimal wear resistance.

The Result

The VTSP units were installed, driven by the original motors, and the wear life on the pumps was increased from

an average of 300 hours to over 1000 hours. The result was an increase in the MTBF of more than three times. The increase in overall pump life was largely driven by the Floway patented sealed-for-life bearing design, slurry mechanical seal, isolation device and hardened materials on the wear parts. In addition, the VTSP design eliminated the need for any type of external flushing, which prevented the risk of dry running the bearings and seals.

The VTSP units were drop-in replacements for the standard VTP units with no costly piping or foundation modifications required. The mine currently operates with half of the pumps as regular VTPs and the other half with VTSPs; it is looking to replace the remainder of the standard VTP units with the VTSP. The VTSP has proven its value by dramatically reducing operational costs and improving system reliability for the customer.

About the Author

David Aldrich is the Product Manager at Floway Pumps Based, in Fresno, CA. He has a BS in Mechanical Engineering from Rochester Institute of Technology and over 30 years' experience in the pump industry.