Chemical Manufacturer Reduces Maintenance Costs by Switching to BJM Submersible Slurry Pump

Authors: Arthur Grammer, Maintenance Manager, Chemtrade Logistics Inc., Wayne Woodcock, Key Account Manager, Pumps, Parts and Service, Inc., and Jay Gallagher, Regional Manager, BJM Pumps

When a pump needs to be pulled from service, the maintenance manager often needs to make the decision whether to have the pump rebuilt, or to replace the pump entirely. Money is often the biggest motivator when it comes to making that choice. Maintenance dollars only go so far, and when older pumps are involved, the cost to rebuild can be higher due to the difficulty of sourcing those replacement parts. When one chemical manufacturer pulled their sump pump, they made the smart decision to replace instead of rebuild.

Chemtrade Logistics, Inc., provides several types of chemicals to industrial companies around the globe. One of their production facilities, located in the state of Virginia, manufactures alum. Alum, which is also known as aluminum sulphate, is used for waste water treatment, pulp and paper, and industrial processing applications. Having a long-standing relationship with Pump, Parts and Service, Inc., the chemical manufacturing plant worked with their reliable service provider to select a pump that would allow them to reduce maintenance costs and improve pump reliability.

The chemical manufacturing plant's central drainage sump relied on an old vertical pump, a Gallagher 2.5 SRB 100X31 Model, to pump slurry that was collected in the sump. The sump collected rain water and water from the plant's mud wash process. The mud wash process involves setting a filter press to press water out of the mud so that the remaining "cake" can then be processed for proper disposal. In addition to the storm water and water from the mud wash process, the sump also collected the wash down water. When the process area was washed down, bauxite (the principle ore of aluminum) would also get washed into the sump, creating a thick slurry that frequently clogged the vertical pump.

One day in April 2015, Wayne Woodcock, Account Manager for PP&S, Inc., was making one of his regular visits to the chemical manufacturing plant. On that particular day, the plant's maintenance team was pulling the vertical pump out of the sump. "The vertical pump had to be at least 25 years old, and the

bottom bearing was completely worn out," explains Arthur Grammer, the chemical plant's Maintenance Manager. "Instead of trying to find parts to piece the thing back together, I figured it might be more cost effective to just replace the pump," Grammer continues. "Wayne was at the right place at the right time, because I asked him if he had any recommendations for a pump that would not require so much attention from my maintenance crew. We were tired of pulling that pump, the repairs were expensive, and we wanted something that was more reliable."

Woodcock, who has supported that chemical manufacturing plant for 30 years, immediately recommended a BJM Submersible Slurry pump. In previous years, he had helped the maintenance team select BJM JX Stainless Steel Submersible Pumps, which had been installed in other applications at the chemical manufacturing plant.

For this specific application, Woodcock recommended the BJM KZN 37 Submersible Slurry Pump for the following reasons:

- **Chrome Iron Agitator to Suspend Solids** – made from abrasive resistant 28% chrome iron, the agitator in the KZN Submersible Slurry Pump makes it an ideal solution for handling the bauxite slurry. The bauxite is comprised of a mixture of aluminum hydroxides, clay minerals, and other insoluble materials; so it was critical to have the high-chrome agitator suspend the solids in the slurry and allow the pump to transport the slurry to the recovery process.

- **Chrome Iron Semi-Open Impeller to Pass Particulate** – the KZN 37 is engineered with a semi-open impeller and has been proven to handle slurries with solids concentrations as high as 70% by weight.

- **Chrome Iron Wear Plate to Resist Erosion** – the KZN Series Submersible Slurry Pump has a replaceable 28% chrome iron wear plate, which makes it erosion-resistant. Erosion on the suction side can reduce pump performance, so the hard iron replaceable wear plate helps to increase overall pump life.

- **Durable Construction for Industrial Applications** – Every KZN has a stainless steel shaft and shaft sleeve which reduces shaft wear from abrasive slurries. The pump volutes are cast from hardened ductile iron, which at 300 Brinnell hardness, are twice as resistant to abrasives as standard ductile iron. The hardened ductile iron volutes are cast with extra thick walls at the point where the pumped slurry enters the discharge.

- **Motor Protection for Reliable Operation** - The KZN Submersible Slurry Pumps are protected by double silicon carbide mechanical seals that are housed in a separate oil-filled seal chamber, and the heavy duty lip seal offers additional protection for the mechanical seals. The motor is further protected with Class H motor insulation, built in amperage (FLA) and temperature overload protection.

- **Slim, Top Discharge Design** – with a slim, top discharge design, the KZN is cooled by the pumped liquid and can pump a sump pit down to within inches of the bottom. A side discharge pump without a cooling jacket must stay submerged to avoid overheating, leaving as much as 3 feet of un-pumped slurry. The KZN would be perfect for the 4-foot deep central drainage sump.

After reviewing all the features of the KZN 37, Grammer worked with his boss to process a “management of change” (MOC) through Chemtrade’s corporate office. If equipment needs to be changed out in the manufacturing plant, and the replacement is not identical to the original equipment, than an MOC is required and reviewed by Chemtrade’s Engineering Department to prove that the new equipment will work in the entire system. The MOC must include the exact specifications and outline the projected cost savings. “It was actually a cost reduction,” explains Grammer. “To get the new BJM submersible pump was less expensive than to repair the obsolete vertical pump.”

Chemtrade's careful evaluation concluded in June of 2015 and they went ahead with the BJM Submersible Slurry Pump. One KZN 37 was installed in the central drainage sump along with the Seal Minder® Moisture Detection System. The Seal Minder® is a sensor probe inside the oil chamber that can provide an early warning to protect the pump motor. When the moisture detection circuit is properly connected to a control panel, it informs the pump operator that there is moisture within the oil chamber, giving them an opportunity to inspect the pump and take preventive measures.

"The KZN has done extremely well so far. It handles solids well, just like advertised. Three months after the BJM pump was installed, it pumped 32,000 lbs. of bauxite slurry over a period of 3 days. It was truly impressive. Needless to say, we're very satisfied with BJM Pumps," declares Grammer. "Moving to the KZN has benefitted us with noise reduction in the process area, improved fluid handling, reduced our repair costs, and freed up our maintenance team to work on other plant projects."

About Chemtrade

Chemtrade operates a diversified business providing industrial chemicals and services to customers in North America and around the world. Chemtrade is one of North America's largest suppliers of sulfuric acid, spent acid processing services, inorganic coagulants for water treatment, liquid sulfur dioxide, sodium nitrite, sodium hydrosulfite and phosphorus pentasulfide. Visit www.chemtradelogistics.com.

About Pump, Parts and Service, Inc.

Formed in 1980, PP&S is a regional distributor of rotating and process equipment serving industrial, municipal, and energy markets throughout the Southeastern United States. Headquartered in Charlotte, NC, PP&S offers comprehensive services to support systems design, performance optimization, equipment longevity, inventory management, and process and management facilitation solutions. Visit www.pp-s.com.

About BJM Pumps

BJM Pumps®, headquartered in Old Saybrook, Connecticut, has been providing fluid handling solutions for industrial and municipal services since 1983. Over its thirty year history, BJM Pumps has grown quickly by supplying world class pumps and accessories, priced competitively, through its global network of stocking distributors. Visit www.bjmpumps.com.