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Memo

TO : Greg McCaffery

FROM : Steve Hoambrecker, Project Manager SH

CC :

DATE : October 31, 2011

SUBJECT : Replacement SW WWTP scum pump

Background Information:

The wastewater sludge handling system for the clarifier/oxidation ditch at the SWWWTP consists of dedicated Return Activated Sludge (RAS) pumps, Wasting Sludge Pumps (WAS), and a Scum pump.

All of these pumps are necessary for the proper operation of the biological breakdown of industrial and human waste products (RAS), removal of excess and expended sludge (WAS) and the removal of floating debris and solids that cannot be further broken down (Scum).

These pumps are all submersible style pumps working in an extreme environment of heavy solids content fluid including corrosive materials, large solids, and fine grit. The original pumps are all ABS brand pumps installed in the 2005 upgrade of the facility. These pumps have experienced faults mostly due to the failure of internal seal material and intrusion of fluids into the motor windings causing rapid breakdown of the insulation and shorting of the wiring from phase to phase. This type of failure is generally not cost effective for repair as it relates to the cost of replacement.

Currently all of these pumps have been replaced within the past two years with the exception of the Scum pump. Note that the Scum pump and the WAS pumps are the same type and size of pump and the plant operators have switched pump locations/uses to keep plant operations in compliance with environmental laws during the time it takes to obtain funding and have a replacement pump shipped (up to several months).

In some extreme cases a pump has to be rented and hooked up to temporary electrical controls and discharge hoses to keep the plant operational. Currently a small gasoline pump is being utilized to pump out the Scum collection box. This solution requires constant attention and extra man hours expended (the plant was designed for unattended operation). The gasoline pump is not designed to handle a continuous loading of this type.

In consultation with pump suppliers, repair providers and operators of similar equipment and processes the rather rapid deterioration of seals and bearings became the focus. While the material the pump is called on to deliver is often the controlling factor for pump selection it was mutually agreed that, in this case, the corrosive composition may be playing a large role in the pump failures.

Replacement Alternatives

The cost of direct replacement with the original installed brand pump is approximately **$6,000** with a month+ lead time. Due to the history of failure with the current pumps it was decided to evaluate alternative products: Two similar pumps were evaluated: Ebara D series - **$9,000** Flygt HD model - **$10,500**. The current ABS model has lasted 2-3 years in operation. The Ebara pump is anticipated to last 4-6 years and the Flygt has an anticipated life expectancy of 6-8 years. The Flygt model has heavy duty seals and stainless shaft components. The ABS or the Ebara does not have the stainless steel internals or the exterior coating. The Chloride levels at the SW plant ranges from 400 mg\L to 800 mg\L. Our research has shown salinity has a major part in the life span of a pump

The following table illustrates that based upon a longer life expectancy the Flygt pump is the best costs.

Brand	Cost	Life Exp	Cost/Yr
ABS	$6,000	2 - 3	$2,400
Ebara	$9,000	4 - 6	$1,800
Flygt	$10,500	6 - 8	$1,500

Recommendation

Due to the high salinity of the influent waters in the Southwest Wastewater Treatment Plant process, Veolia Water NA recommends the purchase of the Flygt. It appears to be more suitable for the material within the treatment process. Changing to a different pump will allow for a better determination of compatible equipment and replacement lifespans within this operating environment. The more heavy duty stainless steel Flygt has increased life expectancy which actually make it the best annualized cost @ $1,500 per year.