

NON-METALLIC SEALLESS PUMP FOR HYPOCHLORITE DISTRIBUTION AT QURAYYAH SEAWATER PLANT, SAUDI ARAMCO

Sharib A. Khan, CMRP, CRL, Machinery Lubrication Analyst Lvl-1, Vibration Analyst Cat III, TapRoot Analyst

Senior Reliability Engineer – Sea Water Injection Department, Saudi Aramco

Introduction:

Qurayyah Sea Water Plant (QSWP) of Saudi Aramco in Saudi Arabia is the world's largest seawater treatment filtration plant for oil reservoir injections. It has current capacity to produce fourteen (14) million barrels per day of treated seawater. The treated seawater is injected into producing petroleum reservoirs to support oil production and to obtain optimal oil recovery. As a rule of thumb, one barrel of water is required for injection for each barrel of oil to be produced. Continuous improvement is incorporated into the culture of Saudi Aramco and all its department striving for operation excellence. This culture is the driver for enhancement in the field of maintenance & reliability.

Background:

QSWP has six hypochlorite pumps supplying continuous hypochlorite for its operation of seawater treatment. These pumps were made of titanium, which is costly material to produce parts. These pumps are continuously operated for operational requirement and also gets damaged quite frequently due to many reasons of its process characteristics and some abnormality.

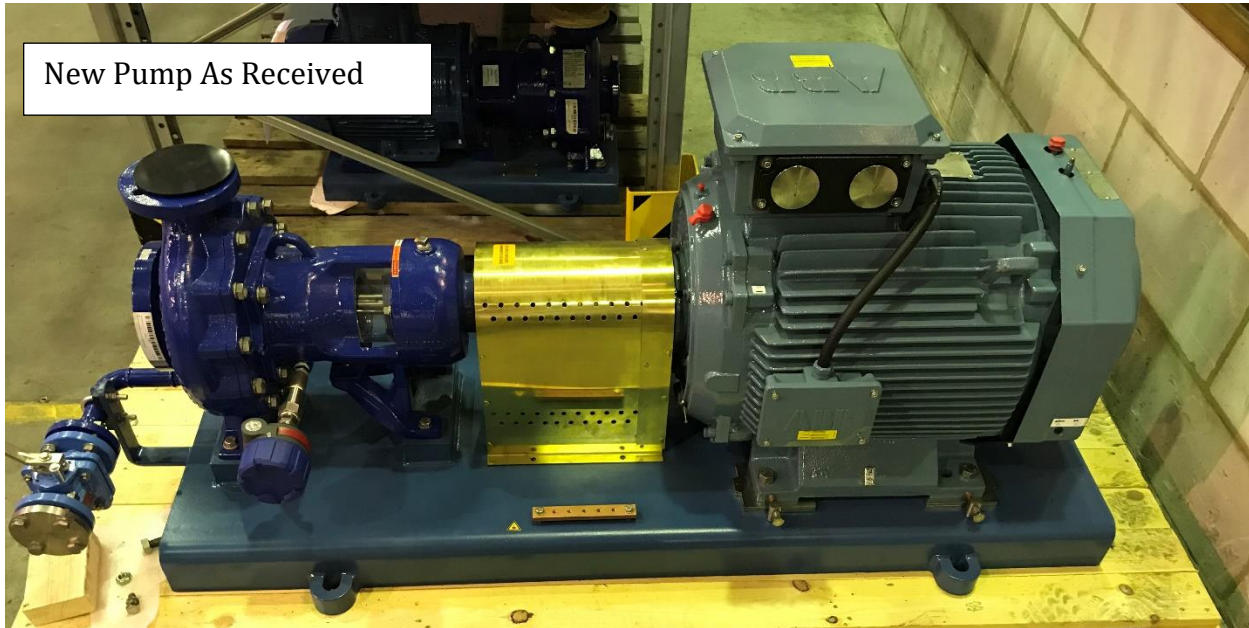
New Technology Description:

Non-Metallic Sealless Pump for Hypochlorite Distribution are being installed in Qurayyah treatment-1 and treatment-2 areas. A non-metallic sealless pump for hypochlorite distribution will replace the existing high-cost titanium pumps. The non-metallic sealless pump for hypochlorite is being supplied by a local vendor, while the high-cost titanium pump is being supplied by an out-of-country vendor. The spares of the titanium pump are not only very costly, but also take a long lead time to procure.

This type of pump is reviewed and approved by the central engineering division for rotating equipment as well material engineering group. The wet internal parts in contact with the hypochlorite solution is carbon fiber reinforced ETFE and the pressure containing factor is Aramid (Kevlar) fiber reinforced vinyl ester. In general, ETFE material is suitable to be used in presence of hypochlorite solutions, with operating temperature up to 145 degrees Celsius.

One non-metallic sealless pump for hypochlorite distribution is already procured and installed at treatment-1 and has been tested for its performance. It has following salient features:

- Idea is related to SWID challenges for corrosion control
- The cost of acquisition and operation is quite low in compared to existing titanium pumps
- How much money in " \$ " do you expect as a cost saving/cost avoidance from your idea?
\$100,000.00 for each pump



New Pump As Received



New Non-Metallic Pump as installed at Treatment-1 Hypochlorite Distribution