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### **SUCCESS STORY - SEA WATER APPLICATIONS**

Pacificchem Corro CRP non-metallic chemical process pumps have proven themselves as an exceptionally good replacement pumps for exotic metal alloy metal and rubber lined pumps on corrosive and erosive applications over the past twenty five years. They are also ideal for sea water and chlorinated water applications found in aquariums, leisure pools, municipal swimming pools and zoos and often replace cast iron epoxy coated pumps or "inexpensive" plastic pumps which generally experience short service life and are expensive to maintain, although initially relatively cheap to install initially.

The following is a self explanatory success story for Pacificchem Corro CRP pumps on a very corrosive sea water application in Queensland, Australia.

In 2005 Total Pump Solutions Australia became involved with an Australian consultant and end user who were looking at solving a major problem at a sea water lagoon leisure pool in North Queensland. The lagoon had been in operation for about three years and during this time major problems had been experienced due to corrosion on two large sea water pumps which are required to circulate the sea water as part of the filtration system.

The pumps operate twenty fours a day seven days a week and circulate 400m<sup>3</sup>/hour to a total head of 14 metres. The sea water contains small particles of beach sand, high salinity levels of between 25,000ppm up to 35,000ppm, high Chlorine levels and pumping temperatures up to 30°C. The application was not only a corrosive application, but also of an erosive nature.

The original pumps installed were manufactured in all bronze material. Due to the extremely corrosive nature of sea water at elevated temperatures plus having extremely high salinity levels and the existence of the beach sand in solution, the service life of the bronze pumps was limited, as was discovered by the client. Major problems were caused by excessive wear from corrosion and corrosion/erosion on the pump casing, impeller wear rings, impellers and shafts and generally the pumps were overhauled every six (6) months. The operating costs were thus exceptionally high as in most cases a complete pump overhaul was necessary as impellers, wear rings, shafts, sleeve and mechanical seals were replaced, not to mention the cost of labour and down time. The filtration system also suffered due to the quick fall off of pump efficiency and loss of pressure as the pumps showed signs of wear.

To overcome the problems various recommendations were made including:

1. Ceramic coating the wetted pump components - this was considered a short term option.

2. Install new pumps manufactured in Duplex Stainless Steel or Nickel Aluminium Bronze - this was a very expensive option.

Total Pump Solutions Australia then became involved and recommended our standard Pacifichem Corro CRP close coupled pumps manufactured in Grade SR 017 synthetic thermosetting resin material. The pumps recommended were two Pacifichem Corro CRP 250-200-400 close coupled pumps fitted with John Crane Type 502 mechanical seals with silicon carbide faces and the pumps were direct coupled to 30kW 6 pole electric motors and mounted on SR 017 synthetic thermosetting resin material bases.

Two pumps were ordered which were delivered within 4 weeks of receipt of the order and were installed in late 2005. It was decided by the client that based on the previous pumps performance, the Pacifichem Corro pumps would be stripped for inspection after operating for three months to check for wear on the pump components. Based on the previous bronze pumps the client believed the new replacement pumps would show signs of erosion and corrosion when inspected. After three months of operation and with no drop off in performance it was decided not to inspect the pumps due to their good operating performance.

Eight months after the pumps were commissioned it became necessary to drain the sea water lagoon for maintenance on another part of the system and it was decided to inspect the pumps for wear even though the pumps were still operating at the same performance level as when commissioned. One pump was stripped and although it showed signs (i.e. scratches) of solid material having passed through the pump chamber, there was absolutely no wear on any of the components, nor any signs of corrosion or erosion on the pump. As a result the client decided there was no need to inspect the second pump.

The second pump was inspected after fourteen (14) months due to other work being undertaken and it too was found to be in perfect condition with no wear or corrosion. The mechanical seal was replaced, although it was not leaking and new casing o-rings were fitted and the pump was reinstalled. The pumps are still operating without any drop of performance.

It should also be noted that this success was totally expected based on the ability of the pump to operate in the most severe corrosive and corrosive/erosive applications found in industry.

Other interesting facts on the above success with the Pacifichem Corro CRP pumps were:

1. We were later informed the Pacifichem Corro CRP pumps cost significantly less than the original all bronze pumps.
2. Prior to the Pacifichem Corro CRP pumps being installed, it was necessary to wear ear protection in the pump station as it was impossible for staff to talk to each other within close proximity of the pumps and filtration system. Once the Pacifichem Corro CRP pumps were installed, it was possible to stand next to the pumps without any ear protection and hold a normal conversation.

3. Staff on-site were amazed at how easy it was to install the pumps being close coupled units and that no alignment was necessary after installation. This is a great advantage over long coupled pumps and overcomes the normal mechanical seal, coupling and bearing problems experienced on pump sets that have not been aligned properly. The inspection strip down was far easier and quicker to undertake than with the original pumps.
4. As the Pacificchem Corro CRP pumps and bases are manufactured in synthetic thermosetting resin material there is no need to ever paint or maintain them externally. The base also exceeds the stiffness of a comparable steel base, whilst offering the same corrosion resistance as the pump.
5. Spare components (impeller, shaft etc), although not ordered by the client, are less expensive than the original all bronze pumps.