CASE STUDY

IN SITU CORROSION REPAIR TO PUMP KEEPS DESALINATION PLANT OVERHAUL ON TRACK

CLYDEUNION® PUMPS

- Delays due to unexpected corrosion issue averted
- In situ repair effected within original outage timeframe
- No loss of desalination service during water shortage

Pump installed at site

Industry: Industrial - desalination

Region: Asia Pacific

Category: Service Centre overhaul

API Type: BB3

ClydeUnion Pumps Aftermarket Technical Services team has experience across a range of services on critical rotating and reciprocating equipment to improve operational safety, reliability and efficiency. The drop-in replacement of two original Bryron Jackson pumps for the oil and gas market is one of our success stories documented in our library of case studies. These case studies highlight the requirement from the customer, how we achieved the goal and the process we followed to deliver the improvements.

CHALLENGE

The pump at the centre of this case study was operating as a booster pump for a desalination plant pumping warm seawater. The CUP split case pump had been in service for over five years and was scheduled for an overhaul due to a drop in efficiency caused by increased running clearances.

The customer had a replacement rotating element to swap out and a full set of replacement bushes ready to go. However, when the top half casing was removed crevice corrosion was apparent on the gasket face. The two regular methods of either replacing the casing or weld repairing it would significantly delay the overhaul.

With a shortage of water in the area, the customer wanted to overhaul the unit in a very short time period to minimize downtime and maintain the supply of desalinated water.

replaced by one, and the liquid pumped is passed by five holes that represent an area equivalent to the former version. To prevent corrosion, the bearings were also upgraded to a material with superior wear and abrasion characteristics, plus better chemical compatibility.

SOLUTION

The original pump casing material of Duplex Stainless Steel was selected for a less onerous fluid than was actually found at site. The customer was advised to upgrade any future spares to Super Duplex Stainless Steel, which has a higher pitting resistance equivalent number (PREN) value and is therefore more resistant to crevice corrosion than the original material.

To address the immediate problem, ClydeUnion Pumps undertook a detailed investigation. This revealed that the damage to the casing did not significantly break into the hydraulic passage area, so use of a metal filler compound was an acceptable interim measure. The selection of the correct metal filler for the application was critical to ensure it would withstand the corrosive nature of the warm seawater and the high pressures exerted onto the flange face during normal operation.

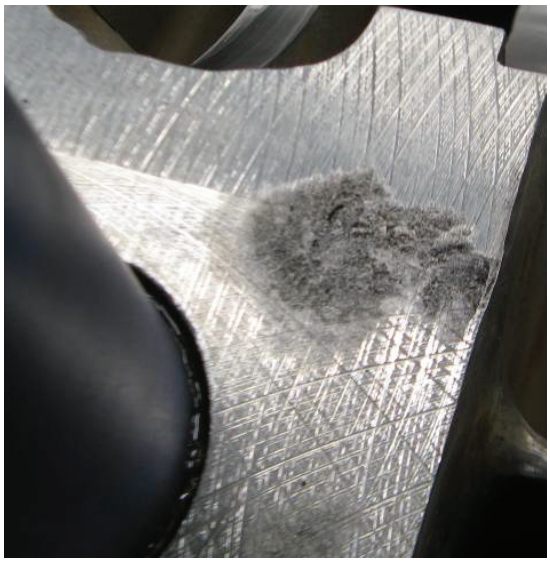

Figure 2 – crevice corrosion on split flange

OUTCOMES

The repair method used by ClydeUnion Pumps meant that the pump casing could remain in position and this significantly reduced the repair time of the casing. (It took two days to complete the work, including cure time for the filler.) This meant that the unit could be rebuilt and commissioned within the ten-day turnaround.

When the unit was started up, the pump ran with increased efficiency combined with normal vibration and temperature levelS.

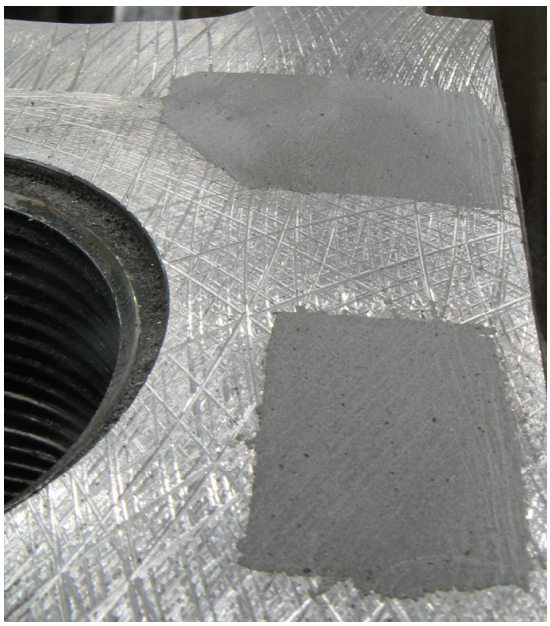

Figure 3 – finished repaired surface

FINANCIAL ILLUSTRATION

The financial advantage of using this repair method instead of replacing the casing or performing a weld repair was significant in both cost and downtime for the customer.

The benefit of utilizing the OEM Aftermarket division is demonstrated in this case study where using the OEM's product knowledge, Quality Management System and processes returned this pump to service quicker and at lower cost than using traditional repair methods. This fast track project returned the pump to full operation which in turn protected the customer's water generation capacity.

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Ref no: CUP_379_04_BB3-DESAL_GB Version: 10/2020