

CASE STUDY CUP-BB3 MULTI-STAGE SPLIT CASE PUMP OVERHAUL



Overhaul of DVMX for diethyl amine pumping process

Industry:	Oil + Gas - petrochemical
Region:	Europe
Territory:	France
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 pump overhaul of the DVMX 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.

Image left: DVMX 3.4.9 10 stages pump after repair

Situation

The customer possesses 2 DVMX pumps for a DEA (Diethyl Amine) pumping process. The pump currently in operation shows worrying signs of wear (collapse of characteristic and efficiency), while the other spare pump was already damaged. After several failed attempts of overhaul by a competitor, the customer required ClydeUnion Pumps to repair the spare pump in the shortest time span, to be able to re-install it on the process as soon as possible.

Challenge

The DEA processes are very aggressive towards steel materials, only a few metallurgies are able to resist more or less to corrosion induced by DEA pumping. The pump was sent back to the factory without the rotor, all rotor parts were too damaged to be repaired. The pump casing showed high erosion/corrosion marks, leading to loss of material particularly on grooves for casing wear rings and volute tongues.



Pump casing

>ClydeUnion Pumps

Solution

The solution was to carry out weld repair on all the damaged parts of the pump casing and supply of a new rotor. The difficulties were the accessibility of certain parts and the perfect control of intensity and temperature during the welding. A non-controlled welding can lead to a change in metal properties, and stress and strain on the casing.

- Cleaning of all parts
- Strip down and full dimensional inspection of parts
- Machining of eroded parts (Figure 1)
- Refurbishment of parts by weld deposition, heat treatment and re-machining of pump casing (*Figure 2 and 3*)
- Grounding plates added
- Re-assemble with a new rotor, hydrostatic and performance tests
- Clean down and paint



Figure 1



Figure 3

Operational improvements

The pump has regained its original characteristics and has very low vibrations levels. The repair was completed in 20 weeks and is operating well.

Financial illustration

Investment cost of parts supplied

170,000 Euros for pump casings repair, complete rotor, various parts and tests.

Cost savings

The customer avoids the losses of productivity linked to a total shutdown of the desulphurisation unit and the unemployment of people working on this unit. The increase in efficiency will lead to electrical consumption savings and the decrease in vibrations levels will lead to decrease of routine maintenance cost.



Figure 2



Figure 4: DVMX 3.4.9 10 stages pump before repair



P: +44 (0)141 637 7141 F: +44 (0)141 633 2399 E: cu.sales@spx.com

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