

SULZER

Expert main **oil line** **pump upgrade** saves time and cost

CUSTOMER

International oil company (IOC)

LOCATION

Offshore, Malaysia

INDUSTRY

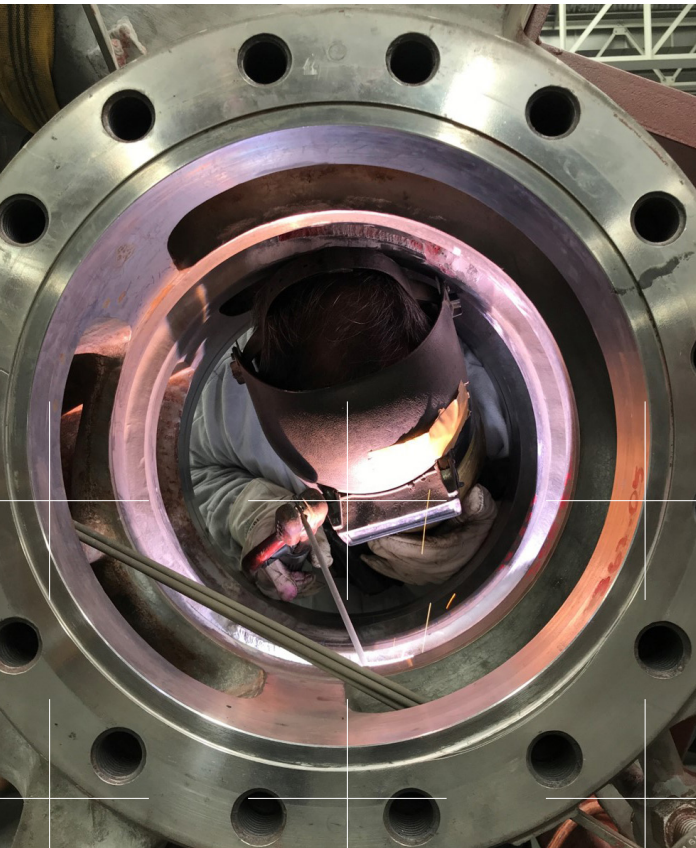
Upstream Oil & Gas

KEY SERVICES

1. Root cause analysis

2. Repair & Maintenance

3. Retrofit



THE CHALLENGE

Expanded oil field accelerates abrasion of pump components and failure risks



Having achieved excellent reliability for almost 20 years with very little change in pump performance, engineers on an offshore platform detected accelerated abrasion rates on one of its MOL pumps during monthly ultrasonic testing (UT). An expanded oil field had led to a change of application, causing a marked increase in sand and particles passing through the pump. The IOC required a rapid pump repair and upgrade while a standby operated as the main asset to secure oil transfer uptime.

- Increased erosion identified at impeller tip, internal passage flow, shrouds, inlet vanes and casing cut-water areas.
- Repairs to the pump casing, shrouds, inlet vanes and a new impeller were required
- The lead time on a new pump casing was one year.
- New pump upgrades were needed to resist abrasion, improve durability and maximize service life.
- Any downtime would halt the transfer of oil from the platform.



1. Original pump having undergone close to 20 years of operations

2. Impeller with heavy erosion marks

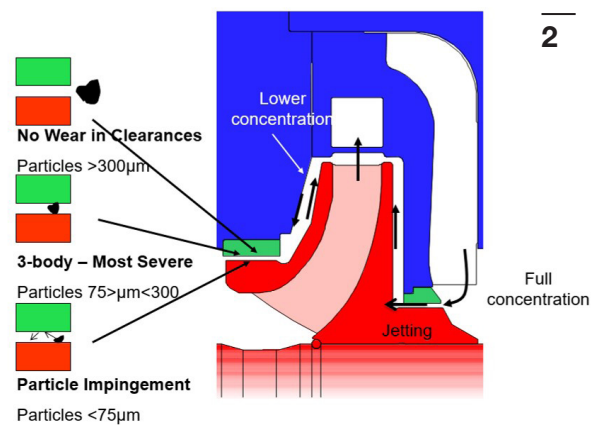
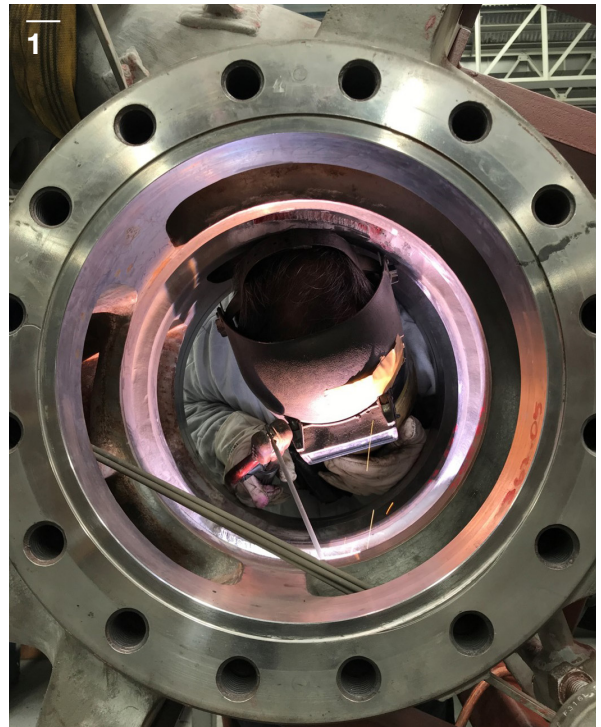
3. Shaped cutwater design

THE SOLUTION

360 retrofit solution extending pump durability

Thanks to its unmatched experience and expertise as a global original equipment manufacturer (OEM) for pumps, along with its reliable supply chain, Sulzer could complete the upgrade in 12 weeks. A fast-tracked alternative to procuring an entirely new pump casing which would take 1 year. Sulzer's leading technical expertise within the upstream oil and gas sector ensured it could meet the durability requirements of the new oil field application. A comprehensive solution supported by root cause analysis, abrasiveness evaluation, mechanical design changes, specialized coating deposition and robust testing was delivered within with expected timeframe.

- Weld overlay and hard-facing techniques were used to build up the base casing material and improve abrasion resistance.
- A section of the volute had to be removed and replaced to complete the casing repair.
- The pump was upgraded with new seals and bearings.
- Sulzer's metallurgists applied high velocity oxygen fuel (HVOF) coating to all wetted areas except for nozzles, suction areas and seal chamber as agreed with customer.
- A new impeller was installed, which underwent boron chemical vapor deposition to enhance durability.
- The cutwater design optimization upgrade will eliminate horseshoe vortex formations around cut waters. The shaped cutwater suppresses the conditions that generate the vortex and eliminate the erosion process.
- The pump was reassembled, tested and returned to the IOC on time.



1. Re-welding of the casing and weld overlay in the effected erosion areas

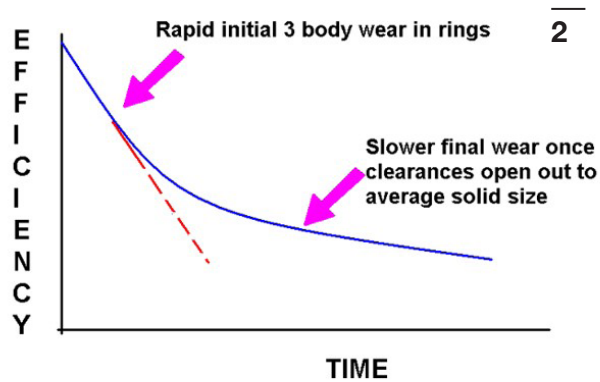
2. Abrasion mechanisms- In pump clearances

A long service life on a short lead time



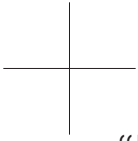
By carrying out a turnkey pump repair and upgrade, Sulzer's experts were able to greatly reduce the lead time and cost compared to specifying new components, all while meeting the demands of the new application. The fast turnaround minimized the risk to platform uptime, safeguarding oil transfer operations.

- The retrofit was completed in 12 weeks with zero external site modification, avoiding a 1-year lead time for a new pump casing.
- All work was completed at 25% of the cost of a new casing.
- The pump was upgraded to provide a long service life and resist increased abrasion.
- A fast repair turnaround time helped to safeguard platform uptime.



1. Retrofitted pump

2. Efficiency impact due to upgrade



“In this case, the customer had a well-planned maintenance strategy and we supported them with a repair that was aligned with their strategy, not only in timeframe but also in terms of budget. With application changes quite commonplace in the oil and gas sector, our ability to retrofit existing components can offer considerable savings in time and investment.”

Manish Talwar, Head of Retrofits Asia Pacific for Sulzer

PROJECT KEY FACTS

COST SAVING

75%

LEAD TIME SAVING

76%

QUALITY ASSURANCE FOR NEW CASING

5 years

THE IMPACT

**Best-in-class
pump retrofit
solution meets field
expansion needs
quickly and cost
effectively.**