

Upgraded pumps empower chemical plant to **boost process pressure faster**

CUSTOMER	International Oil Company's Chemical Plant
LOCATION	Jurong Island, Singapore
INDUSTRY	Petrochemicals, downstream Oil & Gas
KEY SERVICES	<ol style="list-style-type: none">1. Pump retrofit2. Engineering design3. Maintenance4. Field services



Yield boost requirements challenged by pumps' design limitations



To boost yields as part of a wider revamp project, the chemical plant wanted to increase operating pressure in a process area. However, this would exceed the 38 bar maximum allowable working pressure (MAWP) of a large condensate pump at the facility. To achieve the required 45 bar MAWP, operators approached Sulzer for a solution to their problem as it was the original pump OEM.

- The VS6 type barrel pumps could not meet the required increase to 45 bar MAWP
- Replacing the existing pumps with new units would take considerable time
- Increased investment would be required for the customer to source new pumps
- The chemical plant had entrusted Sulzer with finding an optimal solution to the operating pressure increase
- A reserve pump was also needed on-site during the project



1. Dismantling and inspection of pump's components
2. Excessive cavitation present on impeller
3. Status of rotor bundle after operating for years

THE SOLUTION

Re-rate with selective upgrades backed by expert global engineering team

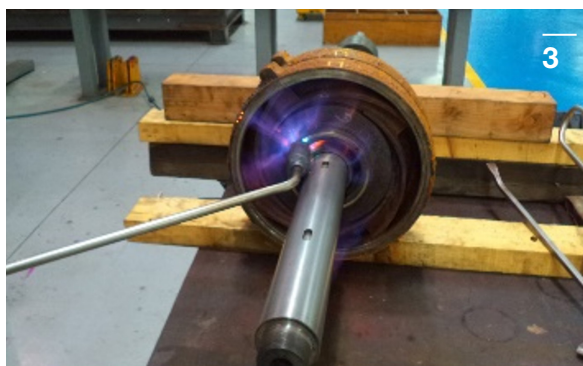
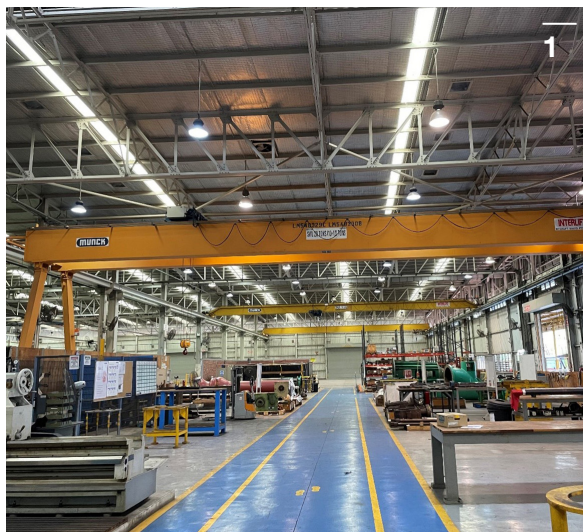
Instead of sourcing new replacements, Sulzer experts examined one of the pumps and proved that with selective upgrades it could achieve the 45 bar MAWP. The re-rate would be supported by testing and recertification while considering all relevant reserve and safety factors. Furthermore, this could be achieved within a shorter timeframe and at a reduced cost compared to sourcing new pumps.

- The pumps were stripped down for analysis at a Sulzer engineering facility in Singapore. Wear parts such as the corroded impellers were identified for replacement, and all other parts inspected and subjected to dye penetrant testing (DPT). The concept of the retrofit solution focuses on salvaging existing components where possible to reduce wastage, costs and in-turn increase turnaround speed.
- Sulzer's unparalleled global engineering network meant that pump experts in Germany joined the project to design and manufacture new pump caissons with thicker walls and upgraded materials to cope with the higher working pressure and improve corrosion resistance respectively. Sulzer engineers also upgraded the seal system to meet the new operating parameters.
- The caissons, seals and other components were then shipped to Singapore where the pumps were reassembled, hydro tested and fully certified for the higher MAWP.
- Dedicated local Sulzer field service specialists installed and commissioned the upgraded pumps at the customer's site.
- The upgrades were carried out sequentially to ensure a reserve pump was always available.

1. The expansive Singapore service center

2. Project delivery - A global effort with considerable inputs from Sulzer Germany

3. Extraction of impeller from shaft by heating



MAWP achieved at reduced time and costs compared to new pumps CAPEX



As a global pump OEM with unmatched product and application knowledge, Sulzer was able to prove that a cost-effective re-rate of the existing pumps could achieve the 45 bar MAWP. Access to Sulzer's pump design and manufacturing expertise in Germany meant new, specialized components could be produced on reduced lead times, with the facility in Singapore acting as a localized focal point for the project and customer. The result was a complete turnkey approach that ensured optimal delivery.



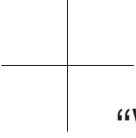
The entire project was delivered in six months, well within the tight schedule of the wider plant revamp. As an additional benefit, the cost of the re-rate project was significantly lower than two new replacements by USD 200'000. Consequently, the plant was able to improve the process and boost yields while reducing expenditure. Rather than providing all-new units, Sulzer prioritized providing the customer with the best possible solution for its requirements. Furthermore, by choosing the retrofit solution instead of installing new machinery, the carbon footprint of the project was minimized, supporting the sustainability aims of the customer.



1. Receipt of new pump at Singapore service center

2. Readying refurbished pump for installation at customer's site

3. Retrofit reduces overall supply chain carbon footprint and promotes the vision of a circular economy



“With our approach, we do not push for a new equipment purchase if there is another option that meets the customer’s requirements. Retrofits and re-using existing pump components can often negate the need to procure new pumps, while also offering a lower carbon footprint overall.”

Manish Talwar, Head of Retrofits Asia Pacific for Sulzer

PROJECT KEY FACTS

COST SAVINGS

US\$200k

PUMP RE-RATE ACHIEVED IN

6 months

PUMP OPERATING PRESSURE INCREASED TO

**45 bar @
92 °C MAWP**

THE IMPACT

Sulzer achieved the 45 bar MAWP with a timely and cost-effective pump re-rate, while meeting customers’ multiple operational and timeline needs.

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