SULZER

Sulzer modernizes international oil company equipment with pump retrofit: 20 pumps over 45 weeks

CUSTOMER	International oil and gas company
LOCATION	Basra, Iraq
INDUSTRY	Oil and gas
KEY SERVICES	1. On-site installation
	2. A bespoke retrofit
	3. Rotating equipment services
	4. Repairs and maintenance

THE CHALLENGE

Erosion and corrosion: The perfect storm

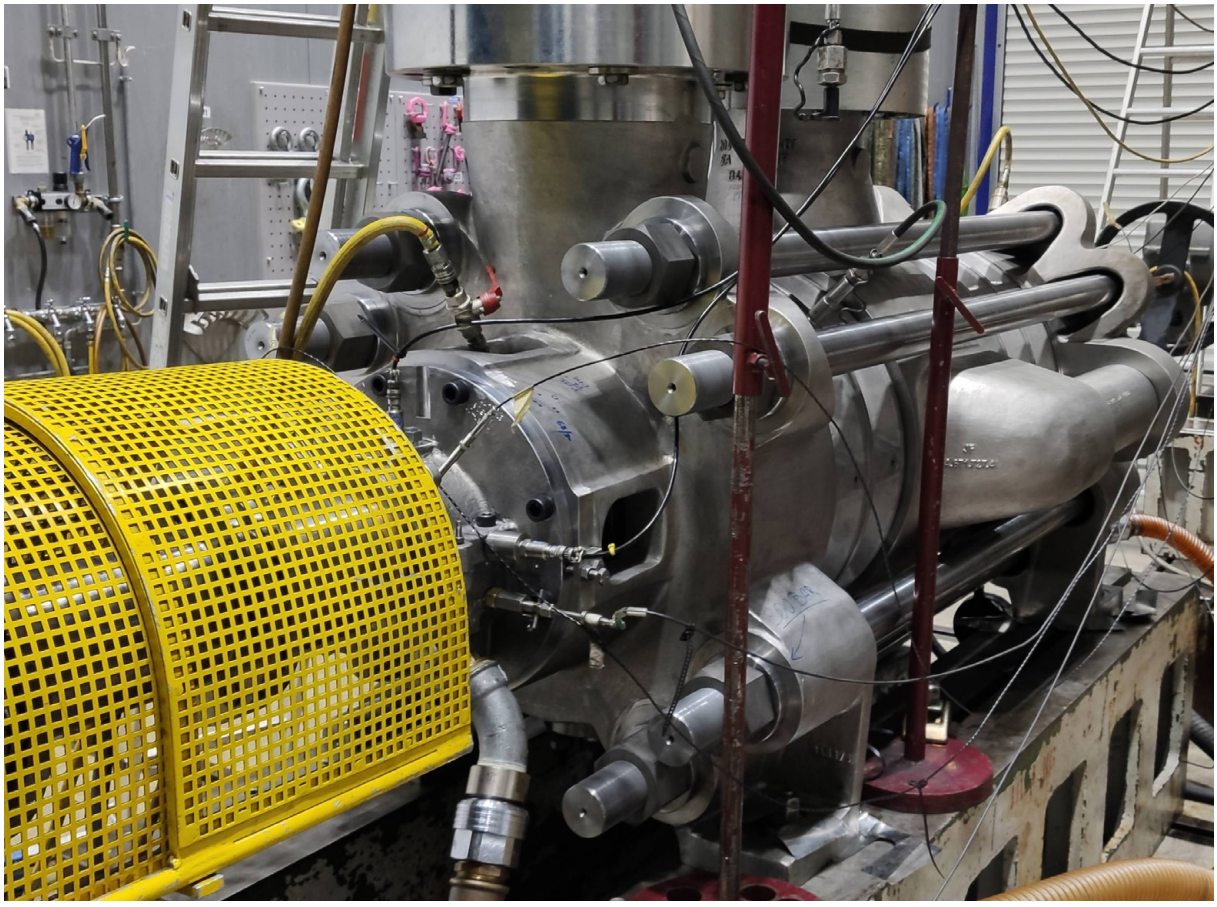
Erosion and corrosion of water injection pumps pose big challenges for oil companies of all sizes. But for large-scale international oil companies, it can result in destructive downtime and a huge loss in productivity and money.

In 2014, an oil company in Iraq – which produced 1.7 million oil barrels a day – approached us to service the main oil line pumps and gas turbine drivers. In 2019, we were awarded the maintenance contract for all rotating equipment. During this period, we had the opportunity to identify the challenges they were having with water injection shortfalls due to the poor reliability of their existing pumps.

“We quickly realized the source water pumps were unreliable – the main problem being erosion and corrosion. As a large company with a vast range of services, we’d seen this type of issue before and had put a tailored solution in place for other clients. So we decided to use a similar method to solve the issue for the oil company, but adapted to their specific needs.” - Alex Myers, Managing Director

The pumps were corroding rapidly, losing head and flow to the point of failure. And because of this the oil company was having production problems and not meeting important goals and targets.

We used our expertise to identify that the corrosion was caused by inadequate materials, coupled with poor design. This was simply because the technology at the time wasn’t as effective and the specific manufacturer they were using didn’t produce the types of material that were needed to stand the test of time.



THE SOLUTION

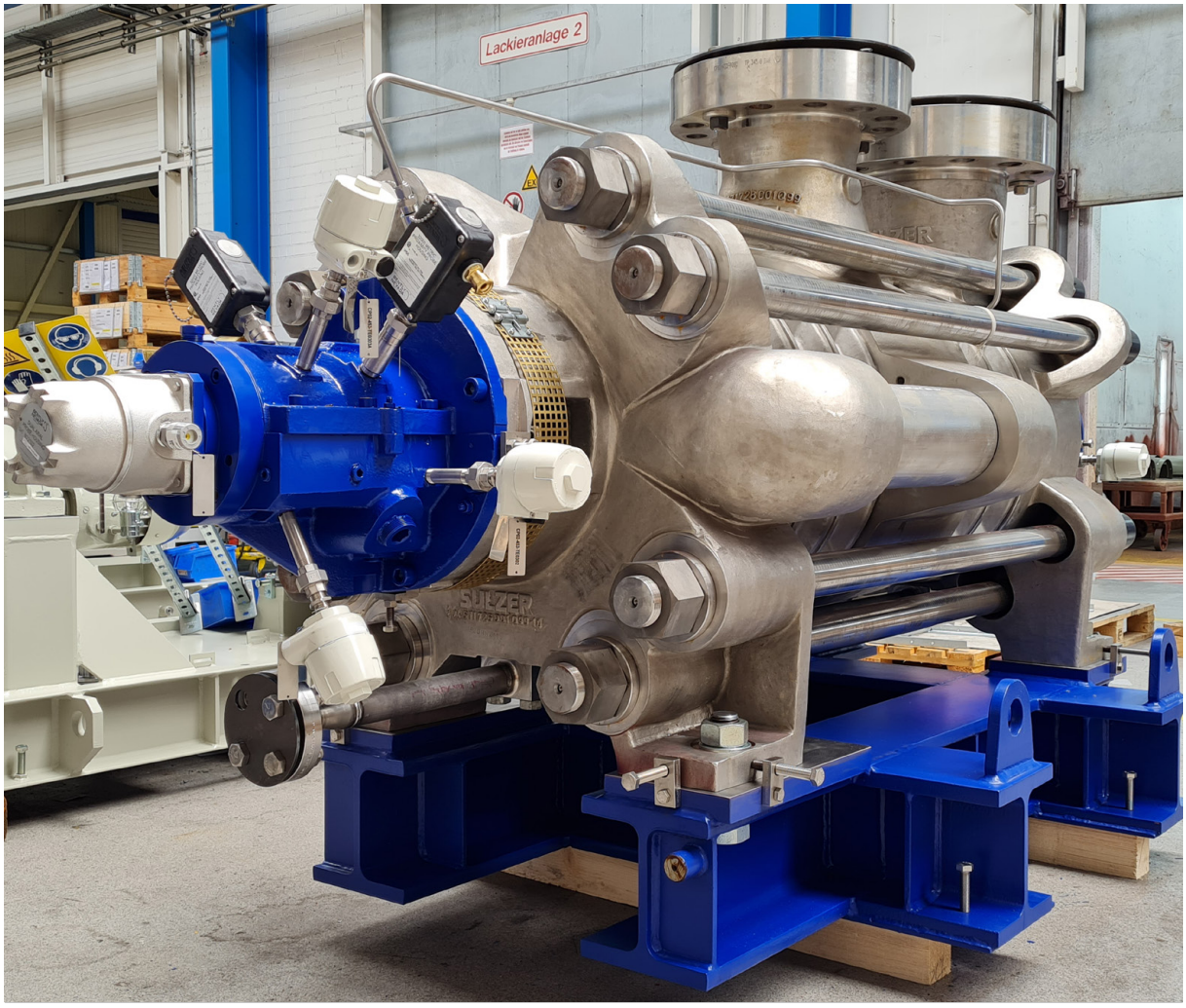
Saying a firm “no” to brand new pumps

The company initially asked if we could support them with reverse-engineering or copying parts to give them access to better materials. Although this would have improved the material quality, most of the inherent design problems would have remained.

The oil company was also considering a project for installing completely new pump packages. Putting in new pumps would have meant reconfiguring all the pipework, new pump houses, and a new injection outage. Fitting new pumps would have been very expensive, with the pump making up only 10-20% of the overall project cost.

As engineering experts, we knew there was a better solution: a retrofit of the existing pumps that would transform performance and offer true reliability. They needed the correct material selection to reduce erosion within the pumps, so the pumps would retain their design and overall efficiency for a long period of time.

We went to the site and surveyed the existing pumps, motors, oil systems, suction/discharge pipework interfaces and foundations. This was done together with the support and involvement of the local maintenance and reliability team.



THE CUSTOMER BENEFIT

A smart retrofit, reducing cost by 70%

The original pumps followed an inline BB5 design, essentially being ring section pumps. We created a bespoke solution that was a Sulzer MD back-to-back, which is a BB4 configuration with two sets of impellers in the opposing direction. There was no reverse engineering needed as we created a completely new pump design for that application, which will be installed step-by-step. The discharge flanges had to be moved and there was loop and pipework modification to the new termination points. The new pump design also has its own base plates that are adapted to the foundations on site.

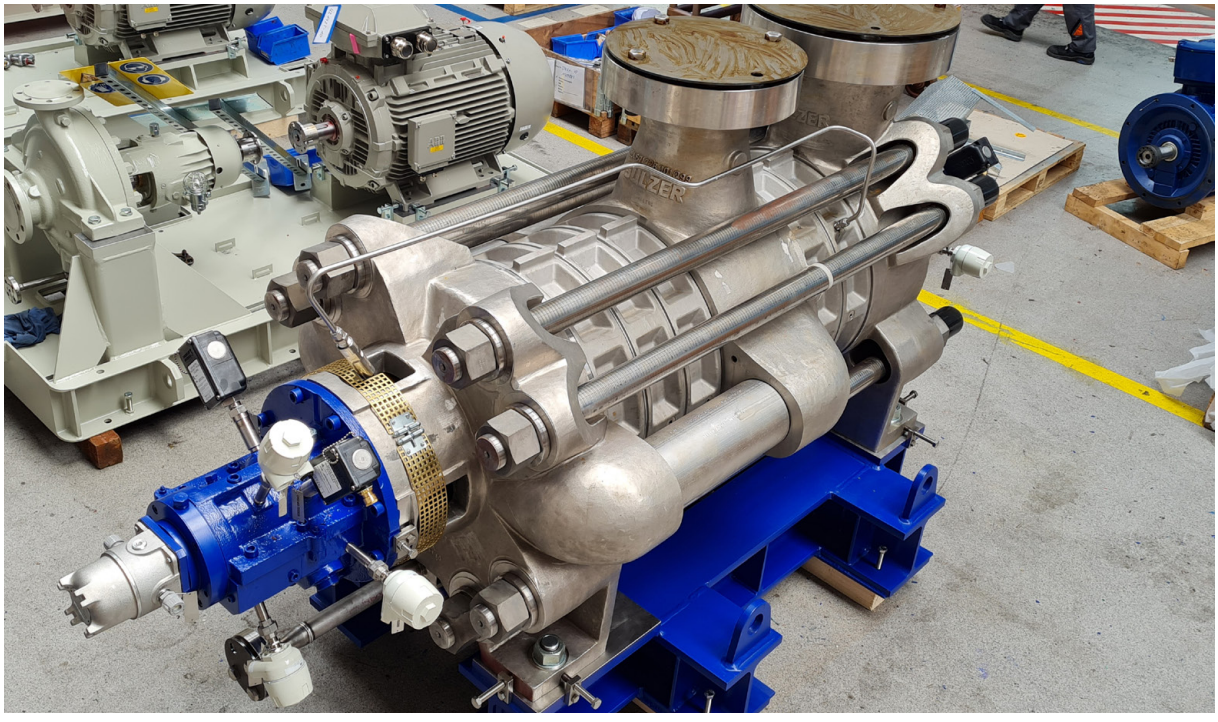
The project was delivered in two phases, each consisting of 10 pumps with each phase delivered across a period of 52 weeks. The installation and commissioning of the modified pumps is currently underway and the upgrade of all 20 pumps will be completed when each existing pump fails, which is planned within a 24-month period.

We used our in-depth knowledge as an international Swiss pump manufacturer to bring an entirely tailor-made solution to solve the problem. The MD back-to-back range had already been developed to address issues with the same manufacturer, in another country, so we knew the retrofit approach already worked. However, we needed to take this method and adapt it entirely to suit the specific needs of the oil field in Iraq – needs that were both material and mechanical.

If water injection pumps fail, production rates fall: It's that simple. When downtime happens, they start to lose injection capacity and as a result, they lose production capabilities rapidly.

A pump breakdown means the pump has to be removed from the site, then waiting around for lengthy maintenance work to happen. Plus, the costs for parts and repair of the original pumps are high and every couple of years they will need to be replaced due to corrosion anyway – so it's a precarious situation to be in.

Our overall retrofit project reduced costs by 70%, which was significantly lower than if we had replaced the pumps with new pump packages. It would have been a major EPC project and involved a lengthy intervention on site, with negative knock-on effects.



“We went the extra mile to find a solution that truly solved the customer’s problem. It would have been easy to accept the project to keep repairing the pumps, but we wanted to look at the project in an innovative way. To give a solution that would increase reliability and efficiency.”

Alex Myers, Managing Director

PROJECT KEY FACTS

PUMPS RETROFITTED

20

COST SAVINGS

70%

ENERGY EFFICIENCY

$1.1m
PER YEAR SAVING IN CONSUMED POWER

MTBF

18 months to ca. 5 years

THE IMPACT

The oil company has seen a boost in productivity, with water pumps that are working at optimal levels. And we’re now their preferred vendor for pump equipment, with a solid ongoing relationship.

As an extra benefit, there has been a reduction in power consumption and far less repair intervention, with less scrap metal produced as a result.

The oil company was able to modernize its water injection pumps and ultimately have the peace of mind, and financial benefit, that comes from reliability.

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