

Pump retrofit benefits

Design changes for new applications and improved durability

Pumps have a hard working life, especially in the petrochemical and oil and gas industries, where some of the fluids can be very corrosive. Specifying the most suitable materials for pump casings, impellers and seals is essential for durability in service. However, changing applications can often leave pumps ill-equipped for their new task. Retrofitting new components or upgrading materials is a cost-effective method of meeting performance and reliability expectations.

Even though most people will never see them, industrial pumps are a crucial part of everyday life. They move water for municipalities, deliver irrigation for our crops and enable large scale construction projects. Pumps provide power stations with water for cooling and steam production, ensuring electricity is generated to keep us moving. Oil, gas and chemical facilities use pumps for transportation and processing; these vital pieces of rotating equipment help keep our lives flowing.

Rickie Nelson, Sales Representative North West Region for Sulzer, looks at the potential benefits that can be achieved when retrofitting pumps.

Pumps are used for a wide variety of applications, and their designs are tailored to meet individual specifications. A great amount of time and effort is invested in achieving the best possible performance and reliability from a pump design. Over time, the specifications may change, or production targets may alter, and this means that the operation of some pumps may no longer be as efficient or as effective as desired.

Improving performance

Increasing production levels is a common objective but all too often this requires design changes to some pumps to ensure they continue to operate efficiently. In many cases, a retrofit will offer a more cost-effective solution, especially when the alternative is to replace the complete pump.

Altering the impeller design whilst retaining the outer casing offers many advantages and this can be achieved with a relatively short lead time. Recent innovations such as additive and hybrid manufacturing have led to huge time savings when creating casting molds as well as the components themselves.

In addition to performance upgrades, the original mechanical design can also be modified to achieve improved reliability and an extended service life. Legacy equipment can benefit significantly from design improvements that have been fully assessed and modelled to ensure the equipment runs smoothly.

Upgrading materials

The materials used to create pump components are instrumental in their durability and when an application changes it may be necessary to upgrade these. For example, the operator of a gas processing plant needed to upgrade two amine pumps to have 316L stainless steel casings to reduce corrosion in the pumps.

In this case, the customer wanted to retain the impeller and driveshaft and upgrade the casings. Sulzer, as the pump original equipment manufacturer (OEM) was able to create these custom casings using the original design drawings and its extensive manufacturing facilities.

The new stainless steel casings were delivered a week ahead of schedule and Sulzer also provided technical support in reassembling all of the pump components so that they could be installed and commissioned. By retaining the original dimensions, the customer was able to keep the stock of pump spares, such as seals, bearings and impellers, minimizing the costs associated with the retrofit project.

Re-engineering

In fact, the pumps could have been made by any manufacturer because Sulzer's reverse engineering expertise enables it to not only manufacture exact replica parts but also optimize them for each application. Even heavily worn or eroded components can be remade as new using hybrid engineering, which combines additive manufacturing and precision machining, to rebuild existing parts back to their original dimensions.

Thanks to the latest in 3D laser scanning equipment, a new drawing for a complex object, such as a pump impeller, can be created in a matter of minutes. Better still, improvements can be made to the original design; upgrading materials, applying modern coatings or increasing efficiency by applying computational fluid dynamics (CFD) models to optimize performance and durability.

Worldwide benefits

Retrofit improvements offer advantages to many different industries and is important that those delivering the projects have an in-depth knowledge of the industry and the application. This should be supported by extensive design and manufacturing capabilities to ensure optimum performance as well as local points of contact for enhanced project communication.

Of course, this can be applied not only to those pumps supported by the OEM. In situations where original designs are not available or original manufacturers no longer offer support, independent maintenance providers can deliver a valuable service. Companies, such as Sulzer, offer retrofit services that can rejuvenate legacy equipment and even develop new parts to improve performance and efficiency. With such a diverse range of pump designs, it is important to find appropriate expertise that can deliver improvements in design through reverse engineering and precision manufacturing.

Image Captions:

Image 1: Sulzer created the custom stainless steel casing and installed the seals and impeller

Image 2: The original pump casing needed to be changed due to a change in application

Image 3: Sulzer engineers work with customers to develop the most effective solution with a short lead time

About Sulzer:

Sulzer is the leading worldwide, independent service provider for the repair and maintenance of rotating machines including turbomachinery, pumps and electro-mechanical equipment. With a global network of over 180 technically advanced manufacturing and test facilities, Sulzer offers a collaborative advantage that delivers high-quality, cost-effective, customized and turnkey solutions, providing its customers with the peace of mind to focus on their core operations.

Sulzer Rotating Equipment Services, a division of Sulzer, can accommodate all brands of rotating equipment including turbines, compressors, generators, motors and pumps. With an enviable track record, dedicated teams of on-site engineers provide best-in-class solutions to ensure that the most effective service is delivered.

Sulzer is dedicated to providing superior service solutions to a range of industries including power generation, oil and gas, hydrocarbon and chemical processing, water and air separation. Every solution is customized to suit the business needs of each application – whenever or wherever that may be.

With a long history of providing engineering service support, Sulzer is headquartered in Winterthur, Switzerland where it began in 1834. Today, with sales over US\$ 3 billion and with approximately 14,000 employees, the Sulzer footprint spans across the globe. The core aim is to deliver a flexible and cost-effective service that optimizes customer operational efficiency and minimizes downtime.

For more information on Sulzer, visit www.sulzer.com

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