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For **fluids handling** problems, try re-engineering your troublesome pumps as an alternative to buying new ones 33

What happens when your pump needs new components, but the manufacturer no longer supplies them? **Oliver Bigginshaw** explores the option of pump re-engineering as an alternative approach to complete pump replacement

New pumps from old

MANY process plants have a life expectancy of over 25 years and during the normal course of operation numerous pump components will need to be replaced. These are usually purchased from the pump manufacturer, but what if that manufacturer is no longer in business or does not have spares for obsolete products? What if a performance increase is needed or new legislation has to be met?

Although maintenance schedules exist for the replacement of routine components, when these components can no longer be purchased from the OEM the alternative is often pump replacement. As the plant is frequently designed around a particular pump, such a replacement usually requires a redesign or replacement of many other items and components.

For many years, there have been companies replicating common maintenance components, such as shafts, wear rings, seal and bearing housings, to replace those supplied by an OEM. However, this process also copies any inherent

weakness in the component. In some cases these replicated parts can cause problems through poor tolerances, inferior materials, quality of manufacture and dimensional fit.

With computer-aided technologies tumbling in price, tools such as three-dimensional modeling software with clash detection and tolerance modeling; computational fluid dynamics; finite element analysis and rapid prototype technologies are now available to design new components cost effectively. These can not only replace OEM components, but even improve on them, allowing components to be designed, simulated, tested and even produced in a full size plastic model. This enables engineers to examine the components before any expensive tooling is committed.

Such re-engineering is not limited to simple maintenance items. For example, if a company is looking to increase the performance of an existing pump, the impeller could be re-engineered for optimum performance for specific duties. All of this could be carried out within the

body of the existing pump.

Barry Darke, a procurement specialist at BP Chemicals, recalls a problem they faced and how re-engineering delivered the solution. 'We had a problem with an existing pump we wanted to use. I called Amarith to see if they could assist. The problem centred around a volute casing and removable suction cover. BP needed to pump some corrosive chemicals and could not afford any leakage. Amarith redesigned the two components into a single integrated volute and suction cover which was radiographed and dye tested, thus providing no opportunity for any potential leakage or corrosion between the joint faces.'

On 1 July 2003 the European ATEX Directive came into force for products that are used in a potentially explosive atmosphere. In practice, this means that where employees may come into contact with pumps where a potentially explosive atmosphere exists, these pumps may have to be changed to ATEX certified ones.

Having to change a pump to meet the ATEX directive is as damaging to production as when a failure occurs. Therefore a practical alternative is to modify the existing pump to meet ATEX requirements by using modern computer-aided tools to redesign the drive assembly and then retrofit this to bring the pump up to ATEX standard. PE

Amarinth designed an all-in-one volute and suction cover for BP (right, with the original components left) which eliminated leakage



Oliver Bigginshaw is managing director of pump re-engineering specialist Amarith

For more information on:

Amarinth 270; or visit
www.e4enquiry.com