Oil and gas industry

Pilot-operated safety valves lowered for space-saving installation





The Challenge

Plant skids are becoming increasingly compact. This saves weight and costs. Attachments, such as fittings, must adapt to the space-saving design. This means that previously used spaces are being reduced in size and therefore components may have to be redesigned.

Magnum Technology Center (MTC) also faced this challenge. The skid manufacturer develops and manufactures complete equipment packages for the areas of well testing and production, underground drilling and managed pressure drilling. Moreover, MTC is not only a manufacturer, but also offers its products as a service provider.

The company has designed a new mobile test separator unit. The three-phase or four-phase test separator is an instrumented pressure vessel for onshore and offshore well testing. It is designed to efficiently separate well effluent into oil, gas and water, and sand with a four-phase separator. The test separator can operate as a stand-alone unit or in combination with the surge tank, reducing the dependency on the separation process for high-quality flow measurements. This separator unit has to be protected by a safety valve with a nominal diameter of 3"x4" / DN80 x DN100. This separator is a vessel used to separate and measure small quantities of oil and gas. Each well is tested regularly by diverting the flow from the production separator to a test separator which determines the production rates of oil, gas and water in the well. The pilot-operated safety valve protects the separator vessel against overpressure that may occur under certain operating conditions. These conditions range from valve failure, e.g. check valves, to fires in the plant.

LESER Solution

LESER was commissioned to supply a valve with an overall height of less than 400 mm. A spring-loaded API valve 3K4 has a height of 758 mm and with bellows even 796 mm. This design was therefore out of the question. The LESER Pilot-operated Safety Valve requires on average 30% less height compared to a spring loaded safety valve. For nominal diameters > 4" (DN100), the overall height is even lower in proportion.

The standard design of the LESER Pilot-operated Safety Valve, at 428 mm, comes very close to the requirement for maximum installation height. The 3" x 4" main valve body is designed according to the API 526 specification and achieves a main valve height of 392 mm, which is in

Facts and figures

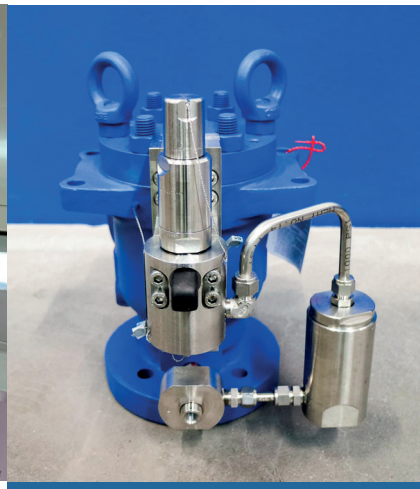
Customer:
Magnum Technology Center (MTC)

Industry / Application:
Oil and gas

LESER Products:
Pilot-operated and spring-loaded safety valves

Number of LESER Safety Valves:
Regular delivery



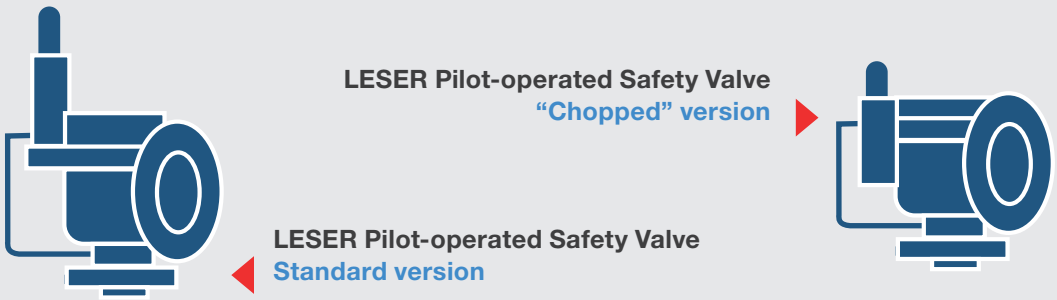


LESER Solution (to be continued):

accordance with the customer‘s requirements. This housing height cannot be undercut when considering the overall height because the flanges and leg dimensions are standardized.

This means that the pilot valve, which is not standardized in the specification, must be designed to maintain the desired height. The solution is to lower the valve and thus further reduce the overall valve height. The LESER designers developed a so-called compact adapter, which is mounted between the main and pilot valves. This allows the pilot valve to be lowered and the height reduced to a minimum – in this case to 392 mm. This means that the pilot and main valve are at the same height.

The LESER solution with compact adapter for particularly low installation heights is as robust as the standard design with pilot and manifold block connection to the main valve. The design is developed in such a way that it can be implemented for all nominal sizes. If very small installation spaces are available, the LESER Pilot-operated Safety Valve with compact adapter is the solution. Even a subsequent conversion is possible, as the existing function-determining pilot is retained. Only the compact adapter needs to be added and pipe segments replaced. This requires only little effort and standard tools for mounting.



Advantages of LESER

LESER develops individual solutions for its customers. The pilot-operated safety valve in the “chopped” version enables the customer to build his product more compact and to use all advantages of this safety valve.

About the customer

Magnum Technology Center, based in Dubai, United Arab Emirates, is a company specializing in providing integrated solutions with advanced delivery to the oilfield industry. MTC designs and manufactures complete equipment packages and, using the latest technologies, offers innovative solutions to its customers.

Why did the customer choose LESER products?

Magnum Technology Center chose LESER because the design meets the height requirements and is particularly robust compared to other manufacturers. In addition, the skid manufacturer was convinced by the extensive technical advice and support during the entire order processing.

“We are pleased to have found an innovative partner in LESER,” says Praseen Vakkayil, Supply Chain Manager, MTC. “The technical solution opens up the possibility for us to offer even better products to our customers in the oil and gas industry quickly and reliably.”