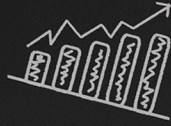
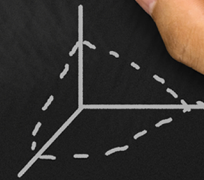


7 X 24
SERVICE



SOLUTION



A STUDY IN SOLUTIONS

Julie Bodine,
ValvTechnologies, Inc.,
USA, explains how effective and innovative valve design and proper implementation can increase process safety, reliability and efficiency.

The oil and gas industry continues to confront some of the most difficult valve application challenges. Companies are required to address environmental concerns regarding emissions, human resource concerns around safety, as well as increasingly demanding regulatory requirements, to name a few. Out of these challenges comes greater demand for high performance products, services and technical expertise that ensures these concerns are first understood and then addressed in the most reliable and cost effective manner.

The following case studies highlight how innovative valve solutions, technical expertise and experience, and a total focus on the needs of the customer can help to improve operations, address regulatory concerns and

ensure the safety of the plant and personnel in various downstream and chemical processing industry applications.

Case study: challenging refinery processes

The delayed coker process is crucial to a refinery's profitability. Coking is one of the most hostile environments in the refinery, with process temperatures of 1000°F/538°C, that yields a very abrasive and erosive coke byproduct. In this application, valves are cycled more frequently than those in other parts of the refinery and failure can cause complete unit shutdown. A refinery in Canada realised these costs first hand when the facility's plug valves were locking up on a routine basis. A



Figure 1. ValvTechnologies' zero leakage high performance metal seated ball valve for coking applications.



Figure 2. Zero leakage valve solutions.

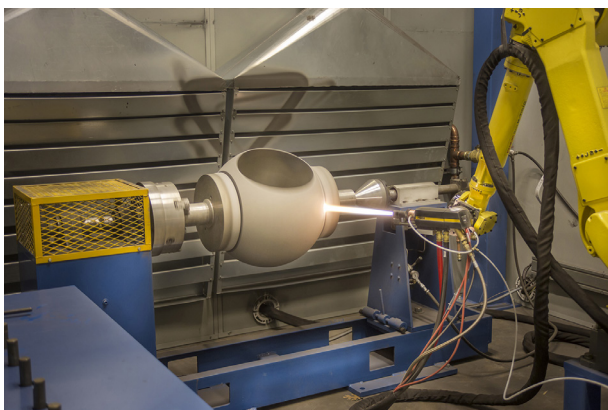


Figure 3. ValvTechnologies' HVOF RiTech®, Robotically Integrated Technology, for high performance valves.

unit shutdown was required to remove the upper bonnets and steam internals in order to free the debris and allow the valves to function properly. Unit shutdowns were becoming routine and very costly.

The delayed coker process is a batch process – one of a few in the refinery complex. The process of switching from one drum to another requires a complex series of events that must take place in perfect sequence in order to avoid major equipment damage. The coker feed (a liquid-vapour combination) is heated in a large furnace and then directed into a preheated coke drum for

cracking and product separation. Delayed cokers are designed as a pair of drums so that one drum can be prepared for the next cycle while the other drum is in operation. This critical application requires valves to cycle on a regular basis, which necessitates high reliability. Operating temperatures vary drastically and state change (coke formation) can occur as the process flows through the switch and various isolation valves. The main challenge for this refinery was related to the existing valves locking up and leaking due to their inability to handle the abrasive feed.

The ValvTechnologies' purge system is a preventative solution that removes the heavy hydrocarbon from the valve cavity before it has the opportunity to change state. This purge system is recommended for coker valves above 8 in. ValvTechnologies was given the opportunity to provide a test valve in the Canadian refiner's coker unit. However, the company was concerned about adding steam to the process and chose not to incorporate the purge system. Without it, there were some initial issues to overcome to ensure the valve functioned as expected. Even without the recommended purge system, the test valve was outperforming all of the plug valves that were in operation at that time. As a result of this test, six valves were ordered to replace the other plug valves. The company eventually incorporated the purge system, and the valves continue to provide trouble free operation today.

As a result of installing a reliable valve with the proper purge system, the facility has realised an increase in operational efficiency. In light of the cost savings achieved as a result of the improved efficiency, the company was awarded the next delayed coking project at this location.

Case study: meeting unique requirements

NatureWorks is the first company to offer a family of commercially available, low carbon footprint Ingeo™ lactides and biopolymers derived from 100% annually renewable resources, with performance and economics that compete with oil-based intermediates, plastics and fibres, and provide brand owners with new cradle to cradle options after the use of their products.

NatureWorks contracted Plant Services, Inc., based in Spring, Texas, which specialises in process engineering, to specify and locate a suitable solution for an existing control valve application. NatureWorks was experiencing ongoing problems with its existing valve, which was installed in 2008 and failed to meet process application requirements due to galling on the ball and seats, resulting in poor reliability.

NatureWorks required a valve that could be modulated to control back pressure and provide tight shut off when closed. The goal was to find a valve that would meet the specifications and provide tight shut off. Plant Services specialists researched numerous manufacturers for a suitable valve for this extremely severe service application and ValvTechnologies was willing to produce a valve to the specifications required.



Figure 4. Aftermarket service and repair is crucial to support the industry's most difficult challenges.

The company selected ValvTechnologies' RiTech® coating technology and VI-2 metal seated ball valve design, and were very satisfied with the quality assurance/quality control (QA/QC) and stringent zero leakage testing performed.

A 24 in. 300 lb metal-seated VI-2 valve was designed and manufactured by ValvTechnologies, and a hydraulic Moog actuator, hydraulic power unit (HPU) system and the automation were designed by Donald Marek and fabricated by Control Fluids, Inc. of Beaumont, Texas. The Eads Company, a ValvTechnologies distribution partner and integrator, provided the package as a complete system and facilitated the final product acceptance test prior to delivery to NatureWorks.

Case study: teamwork builds success

Aftermarket service and repair is also crucial in the effort to ensure customer's concerns are addressed and plants are properly maintained and continue to run safely and reliably, ensuring lower total cost of ownership.

During a scheduled outage, a large plant discovered a valve that would not move. Upon further inspection the customer found a damaged coupler on the valve's mounting bracket. Assuming this damaged coupler was causing the valve to lock up, the company decided against purchasing a new valve and instead simply replaced the damaged mounting bracket. Preparing to go back online, the company found that the valve would still not function.

Planning for outage season can be difficult enough without an unexpected setback or unplanned costs. Unplanned shutdowns cost plants millions of dollars; to prevent paying this high cost, an immediate shipment of a ValvTechnologies' VI-1 zero leakage metal seated ball valve was required to avoid extended plant downtime.

The request was received on a Saturday and ValvTechnologies assembled a cross-functional team to provide the plant with an immediate solution. Representatives across the entire organisation, including the shipping, warehouse and service departments, were called to the Houston office to solve the problem. The

team was able to identify, assemble, test and ship a replacement VI-1 valve by the end of the day that the emergency request was received. The plant received the VI-1 valve on the Monday morning and immediately installed it. The new valve functioned well and the company was able to bring the plant up, saving thousands of dollars in potential downtime and revenue loss.

Case study: service and repair

ValvTechnologies has supplied almost 250 000 severe service isolation valves, which are expected to last between 20 and 40 years of almost continuous operation. Just like any machine, the valves should be inspected and serviced to maintain their performance throughout their operating life. The company's Aftermarket Service & Repair Department plays an important support role, providing inspection and product servicing for companies.

One of these companies is a large refinery in the Texas Gulf area. The refinery has several hundred valves installed – many having been specially engineered designs with unique construction materials. A large number of these valves have been in service for more than 15 years. ValvTechnologies began discussions with the refinery managers about how the company could help refurbish these valves during a large multi-unit plant outage early in the following year. For many months the companies held onsite inspections of the equipment and organised numerous follow up planning meetings with the personnel that were determining the outage schedule. From these meetings, the refinery developed a detailed valve list that consisted of several dozen older valves designated for service and repair. With this list, ValvTechnologies designed an outage support plan to receive the used valves and restore them to 'like new' condition. This plan was a major challenge as there was only one week to turnaround each valve, leaving little time for delay or error.

The company managed almost all of the pre-outage and in-shop planning and work flows. The project was watched around the clock, seven days a week to ensure success. Numerous aftermarket service and repair personnel assisted in the preparation and execution of this large project, alongside several other departments. In particular, assembly and test personnel from the company's shops worked 12 hour days to ensure the valves were repaired on time. Inspectors visited daily to check on the status of the valves in-process and confirm that progress was being made. The end result was that all valves were successfully serviced and repaired and returned to the refinery ahead of schedule.

Conclusion

As a result of supplying the right metal seated ball valves in the most difficult severe service applications, oil and gas companies can take advantage of higher reliability, increased safety and additional plant efficiencies. Recommendations and technical expertise ensures companies in the oil and gas industry that face tough challenges are able to achieve peace of mind. 