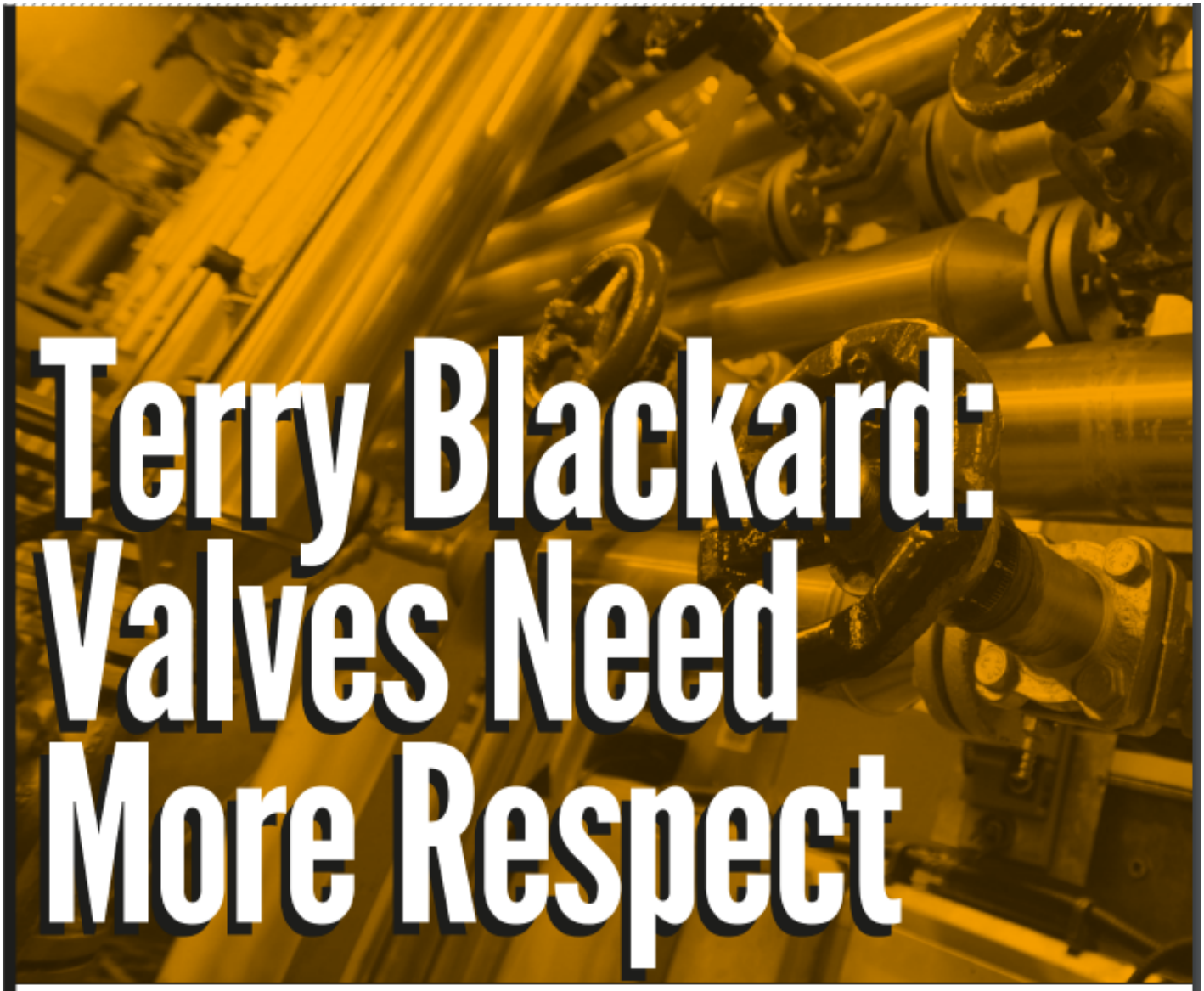

Terry Blackard: Valves Need More Respect

BY KATE KUNKEL

Valves in the oil and gas industry have come a long way in the last four decades, both in terms of higher quality in products and opportunities created by those better products, as Terry Blackard can attest. Blackard has been in the refining/chemical industry for 42 years. The first 40 were with ExxonMobil in Baton Rouge where he was the valve specialist for the complex there. He retired in 2017, then went to work for Becht Engineering as a valve consultant, where he added even more valve challenges to his long career. For the last 16 years, Blackard also has served on the API Subcommittee on Piping and Valves (SCOPV).

That level of longevity and experience makes Blackard an excellent person to ask: How has the industry fared and what challenges have valves and the professionals in the industry faced?

His answers are influenced by a history that goes even further back than his own career. As is the case with many veterans of the industry, Blackard followed in the steps of his father, who worked at Exxon for 37 years before his son joined the company.

According to the junior Blackard: "It's a good career. You might not get rich, but you'll have a satisfying job, a decent salary and a decent retirement."

Executive Summary

SUBJECT: Long-time end-user experts are an excellent source of knowledge when it comes to how the valve world has evolved.

KEY ISSUES:

- Changes in the oil and gas industry
- The challenges faced
- What tomorrow will bring

TAKE-AWAY: The next generation could learn much by listening to those that have come before them.

"Gate valves are still the workhorse in the industry."

VALVE EVOLUTION

When asked how valve quality has improved over the last four decades, Blackard points to upgrades in casting design and quality control, as well as innovations in valve design and materials.

For example, "The old valves [valves of yesteryear] were over-built with extra wall thickness in the bodies, which helped them hold up," he says. "With improvements in finite element analysis and casting modeling, the new designs are much closer to the minimum wall thickness required by standards."

This development has both a positive and a not-so-positive side, he says.

"The plus is reduced weight and material cost while the negative is less metal thickness, so any casting flaws show up quicker," he says.

As far as what's in use today, Blackard notes that while more double- and triple-offset butterfly valves as well as metal-seated ball valves have been put into action over the last decade, gate valves are still the workhorse in the industry.

"I typically recommend using a gate valve unless there is a specific need to change," he says. "The reason is that gate valves are usually available off the shelf and are generally much cheaper while ball and butterfly valves are more expensive with typically longer lead times."

Still, some services will drive a project to use tougher valves. For example, applications with a lot of particulate or coking, where better sealing is needed or where emissions are a challenge lend themselves more towards ball and butterfly valves.

He says that while new and improved valves are constantly in the works, it's not as easy as it used to be for manufacturers to share what they have with the decision makers at refineries.

"This can be a problem because the ability to get into plants is much more difficult since the MARSEC [maritime security] rules were implemented."

It used to be that a rep could go into the plant and meet with engineers on site, he explains. With the new rules, it's more difficult to get into a facility, and many restrictions to access exist.

Blackard recommends that manufacturers facing this issue attend API functions because the major end users are usually there, and those end users are the ones that typically control companies' accepted manufacturers lists (AML).

"If one of these people thinks a manufacturer has a good product, they will usually provide contacts at the local sites," he advises.

Another way for better access would be to work with local suppliers because they usually have contacts in the plants, he adds. Blackard notes that the change from smaller local valve vendors to giant nationwide or worldwide contract holders has affected levels of service.

"Generally, I think it has improved service because the larger suppliers tend to stock a lot more valves," he says. "Also, when they have a large contract, they tend to inventory the type of valves you need," he says.

The downside is they don't stock all manufacturers that might be on the AML so accessibility to some really good valve manufacturers is not as easy as it used to be.

CHALLENGES AND SOLUTIONS

When asked if particular valve types have caused more problems over the years than others in the refineries, Blackard notes that more issues have occurred with gate valves than others. However, that's partly because more gate valves are around than any other type of valve.

"With that said, I have experienced quite a few stem-guided globe valve problems. Failures have ranged from packing leaks to sheared stem failures," he says.

Blackard suggests the reason might be that these valves are put into services that have large pressure drops or they are operated in near-to-close position. The vibration and harmonics experienced during these situations can cause tremendous valve damage, he points out.

"We have tried to train our operators that if a globe valve is experiencing high vibration and making noise, some kind of adjustment needs to be made or the valve needs to be taken out of service," he says.

Another big issue in the industry has been fugitive emissions containment. Although great strides have been made in cleaning up process plant valve emissions in the last 20 years, some areas in an oil refinery still create especially tough challenges.

"Light end units tend to be the toughest units to get a handle on," Blackard notes. "But innovations in valve designs and packing have been the biggest driver of improvements." Better education in the workforce is also a major contributor to less problems.

As an active member of the API's SCOPV for the last 16 years, Blackard has seen great strides in improving valve standards in refineries.

"We have also added new standards like globe valves and standards on testing requirements for packing/emissions," he says.

"The only standard I feel that has gone backwards is API 607 on fire testing. Changes to the 5th edition were a setback in my opinion, and I hope to see this standard improved in the next couple of years," he observes.

UNIQUE SOLUTIONS

When asked if one valve-related problem or issue he helped address stands out among all he saw resolved, Blackard points to a system for stem indication on butterfly and ball valves.

"Stem indication for disc or ball position is typically done with a keyway or marking," he explains.

> *"Valves never get the resources in manpower, planning or maintenance that other equipment tends to get."*

This indication is normally in line with the disc on a butterfly valve and in line with the open ball on a ball valve.

"Nearly all manufacturers do this the same way, but I worked with a couple of manufacturers who did it just the opposite. We actually had an incident of incorrect mounting of an actuator because of this reality," he says.

He had to explain to those manufacturers that, even though they met the standard, they were setting end users up for failure because of their stem indication method.

"Luckily, both manufacturers eventually agreed with me and changed or modified their design to help address this issue."

Blackard says that sometimes the valve problems he's seen have required detective work.

He points to a case where he was dealing with a 20-inch, 600-class gate valve that stuck closed during a unit startup. After some effort, process operators got the valve open, but only about one-third of the way.

"The large actuator looked fine, the stem was checked with a thread gage and it looked okay so there was debate about whether something was stuck in the valve, like maybe a loose or broken seat ring," he recalls.

After more review, the discovery was made that the stem had been stretched during the opening procedure.

"This was undetectable with a thread gage, but if you measured the stem over about nine inches, it was obvious. This large actuator had a large stem nut with about eight inches of thread engagement. We removed two inches of the threads from the coupling and could then operate the valve until we had a repair opportunity," he recalls.

In another situation, Blackard was performing root cause failure analysis on a valve that leaked and contaminated another product line.

"The valve was only eight months old and during the inspection, we noticed the wedge was severely bent. We were scratching our heads because we could not understand the cause and felt certain it was not manufactured this way," he recalls. During discussions with the process team, Blackard learned that the valve was installed several months before, but that the line was just recently put into service. During the valve installation, the capped line had been hydro tested, but because of line orientation, the test water was never drained.

"We had a cold winter, which resulted in this short section freezing the water and bending the wedge, so when the line was put into service, the valve leaked. It taught me to never underestimate the power of freezing water!" Blackard says.

LOOKING FORWARD

When asked if there was anything Blackard wished could be done differently in refining, he says, "I wish we could develop more respect for valves in general. Unfortunately valves never get the resources in manpower, planning or maintenance that other equipment tends to get. People just see a valve and not an engineered piece of equipment that needs to be installed, operated and maintained correctly to achieve safe and reliable operation."

Blackard also offered advice for young people coming into the industry today. "Ask as many questions as you can. Get as much failure data from the old guys as you can," he says.

"Our industry is having a larger turnover as baby boomers like myself retire," he explains. "While we are not any smarter than the people who are replacing us, we have seen a lot of the issues the new group will encounter. It's a shame but I'm sure they will repeat some of the mistakes my predecessors and I have both made." VM

Kate Kunkel served as senior editor of VALVE Magazine from 2012-2018.