

UPDATE

NORTH AMERICAN SAFETY VALVE

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From the
President's Desk



Allen Tanis
President

“A little product education can make you look super smart to customers, which usually means more orders for everything you sell.”

Safety Valve 101

A little product education can make you look super smart to customers, which usually means more orders for everything you sell. Here's a few things to keep in mind about safety valves, so your customers will think you're a genius.

A safety valve is required on anything that has pressure on it. It can be a boiler (high- or low-pressure), a compressor, heat exchanger, economizer, any pressure vessel, deaerator tank, sterilizer, after a reducing valve, etc.

A safety valve usually refers to a valve that will see steam, air, or gas, and a relief valve is used on liquid. Some valves do both.

There are four main types of safety valves: conventional, bellows, pilot-operated, and temperature and pressure. For this column, we will deal with conventional valves.

A safety valve is a simple but delicate device. It's just two pieces of metal squeezed together by a spring. It is passive because it just sits there waiting for system pressure to rise. If everything else in the system works correctly, then the safety valve will never go off.

Why set pressure is higher than operating pressure

A safety valve is NOT 100% tight up to the set pressure. This is VERY important. A safety valve functions a little like a tea kettle. As the temperature rises in the kettle, it starts to hiss and spit when the water is almost at a boil. A safety valve functions the same way but with pressure not temperature. The set pressure must be at least 10% above the operating pressure or 5 psig, whichever is greater. So, if a system is operating at 25 psig, then the minimum set pressure of the safety valve would be 30 psig.

Most valve manufacturers prefer a 10 psig differential just so the customer has fewer problems. If a valve is positioned after a reducing valve, find out the max pressure that the equipment downstream can handle. If it can handle 40 psig, then set the valve at 40. If the customer is operating at 100 psig, then 110 would be the minimum. If the max pressure in this case is 150, then set it at 150. The equipment is still protected and they won't have as many problems with the safety valve.

Here's another reason the safety valve is set higher than the operating pressure: When it relieves, it needs room to shut off. This is called BLOWDOWN. In a steam and air valve there is at least one if not two adjusting rings to help control blowdown. They are adjusted to shut the valve off when the pressure subsides to 6% below the set pressure. There are variations to 6% but for our purposes it is good enough. So, if you operate a boiler at 100 psig and you set the safety valve at 105, it will probably leak. But if it didn't, the blowdown would be set at 99, and the valve would never shut off because the operating pressure would be greater than the blowdown.

All safety valves that are on steam or air are required by code to have a test lever. It can be a plain open lever or a completely enclosed packed lever.

Make sure your customers get the right size

Safety valves are sized by flow rate not by pipe size. If a customer wants a 12" safety valve, ask them the flow rate and the pressure setting. It will probably turn out that they

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need an 8x10 instead of a 12x16. Safety valves are not like gate valves. If you have a 12" line, you put in a 12" gate valve. If safety valves are sized too large, they will not function correctly. They will chatter and beat themselves to death.

The lower the pressure setting and the higher the flow rate, the larger the valve required.

Safety valves need to be selected for the worst possible scenario. If you are sizing a pressure reducing station that has 150 psig steam being reduced to 10 psig, you need a safety valve that is rated for 150 psig even though it is set at 15. You can't put a 15 psig low-pressure boiler valve after the reducing valve because the body of the valve must be able to handle the 150 psig of steam in case the reducing valve fails.

Debris + seating surface = leaks

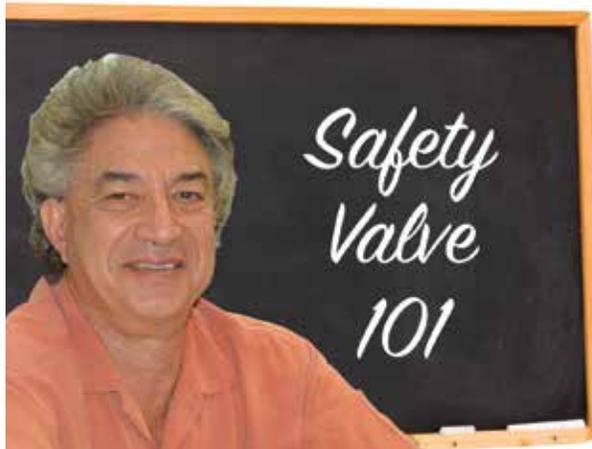
The seating surface in a safety valve is surprisingly small. In a 3x4 valve, the seating surface is 1/8" wide and 5" around. All it takes is one pop with a piece of debris going through and it can leak. Here's an example: Folgers had a plant in downtown Kansas City that had a 6x8 DISCONTINUED Consolidated 1411Q set at 15 psig. The valve was probably 70 years old. We repaired it, but it leaked when plant maintenance put it back on. It was after a reducing valve, and I asked him if he played with the reducing valve and brought the pressure up to pop the safety valve. He said no, but I didn't believe him. I told him the valve didn't leak when it left our shop and to send it back.

When it came back, I laid it down on the outlet flange and looked up the inlet. There was a 12" welding rod with the tip stuck between the seat and the disc. That rod was from the original construction and didn't get blown out properly and just now it got set free. The maintenance

guy didn't believe me and came over and saw it for himself (this was before cell phones when you could take a picture).

Troubleshooting: Some questions to ask

If there is a problem with a safety valve, 99% of the time it is not the safety valve or the company that set it. There may be other reasons that the pressure is rising in the system before the safety valve. Some ethanol plants have a problem on starting up their boilers. The valves are set at 150 and they operate at 120 but at startup the pressure gets away from them and there is a spike, which creates enough pressure to cause a leak until things get under control.



Professor Tanis, NASVI University

If your customer is complaining that the valve is leaking, ask questions before a replacement is sent out. What is the operating pressure below the safety valve? If it is too close to the set pressure then they have to lower their operating pressure or raise the set pressure on the safety valve.

Is the valve installed in a vertical position? If it is on a 45-degree angle, horizontal, or upside down then it needs to be corrected. I have heard of two valves that were upside down in my 47 years. One was on a steam tractor and the other one was on a high-pressure compressor station in the New Mexico desert. He bought a 1/4" valve set at 5,000 psig.

On the outlet side, he left the end cap in the outlet and put a pin hole in it so he could hear if it was leaking or not. He hit the switch and when it got up to 3,500 psig the end cap came flying out like a missile past his nose. I told him to turn that sucker in the right direction and he shouldn't have any problems. I never heard from him so I guess it worked.

Check the outlet piping

If the set pressure is correct, and the valve is vertical, ask if the outlet piping is supported by something other than the safety valve. If they don't have pipe hangers or a wall or something to keep the stress off the safety valve, it will leak.

There was a plant in Springfield, Mo. that couldn't start up because a 2" valve was leaking on a tank. It was set at 750 psig, and the factory replaced it 5 times. We are not going to replace any valves until certain questions are answered. I was called to solve the problem. The operating pressure was 450 so that wasn't the problem. It was in a vertical position so we moved on to the piping. You could tell the guy was on his cell phone when I asked if there was any piping on the outlet. He said while looking at the installation that he had a 2" line coming out into a 2x3 connection going up a story into a 3x4 connection and going up another story. I asked him if there was any support for this mess, and he hung up the phone. He didn't say thank you, goodbye, or send me a Christmas present.

Pipe dope is another problem child. Make sure your contractors ease off on the pipe dope.

That is enough for today, class. Thank you for your patience. And thank you for your business.

Allen Tanis

Recommend Remanufactured Safety Valves with Full Confidence

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Today, many companies are finding when maintenance budgets need to be stretched; a safe way to save is to rely on remanufactured safety valves. Your customer will be back in production faster ... for fewer dollars ... with full confidence.

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full years on both parts and workmanship.

The biggest difference between remanufactured valves and new OEM valves is the cost – about one-half – and the warranty – two years.

Think of the times you've missed a valve sale because of price, availability or delivery. Now you can offer that customer a choice – a solid, safe and sensible choice. The remanufactured alternative.

And offering remanufactured valves will increase your sales!



Behind Our Service



Donny Gasca
Applications Engineer

When Donny Gasca became an applications engineer in February 2018, he'd already been at North American for almost 14 years.

"I worked in the shop before taking this position," he said. "During that time, I'd done every job back there, so I knew quite a bit about the valves themselves."

Since moving to the customer-facing side, however, he's added to his knowledge in a different way.

"I have a much better idea of how important safety valves really are," he explained. "When something goes wrong, safety valves can prevent a lot of damage downstream. My new role has shown me the business from a completely different perspective."

Although he describes himself as a "pretty quiet guy," Donny enjoys the phone contact his new position requires, particularly when

it involves solving a problem and a quick turnaround.

"I get calls from a distributor and it's an emergency. They need the valve tomorrow morning. We have so many valves in stock, I can get the order filled and shipped to meet the deadline," he said. "Then I get an email thanking us for the great service, and that feels pretty good."

When he's not handling rush orders for NASVI customers, Donny likes spending time with his 11-year-old daughter and traveling.

As he continues to settle into his new role at NASVI, Donny intends to keep expanding his understanding of customer needs and safety valves.

"I'm really happy in this position and so glad I have this opportunity. I never want to stop learning."



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NASVI Welcomes New Sales Team Member



Kolby Gabbert has been with North American for nearly a year, and compared to many NASVI employees, he's still a newcomer. Kolby is an application engineer and enjoys the customer contact that it involves.

"I deal mostly with distributors and talk to some of them quite often," he explained. "And I'm starting to build strong relationships with our customers.

"All my work experience has involved inside sales and solving problems for customers," he noted. "I enjoy working through complicated requests, finding the correct valves for the application, sending out quotes and then delivering exactly what they need."

But before he began helping customers, the Sedalia, Mo. native received a thorough grounding on the ins and outs of safety valves.

"I spent several weeks in the shop, first in disassembly – tearing down the valves – then on to other areas. I worked at every station in the shop," Kolby said. "It really helped me translate what the computer says on the front end and understand the back end of the process.

"The long-time employees have been really helpful. They point out I'm spoiled because I started after the new building was completed."

In his spare time, Kolby enjoys soccer, biking and hiking. "I'm a soccer fanatic," he said. "I played soccer in college. I'm a Sporting KC season ticket holder and still play four times a week."

For the future, Kolby's goal is clear: Continue delivering the fast, accurate and knowledgeable service NASVI has always been known for.



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