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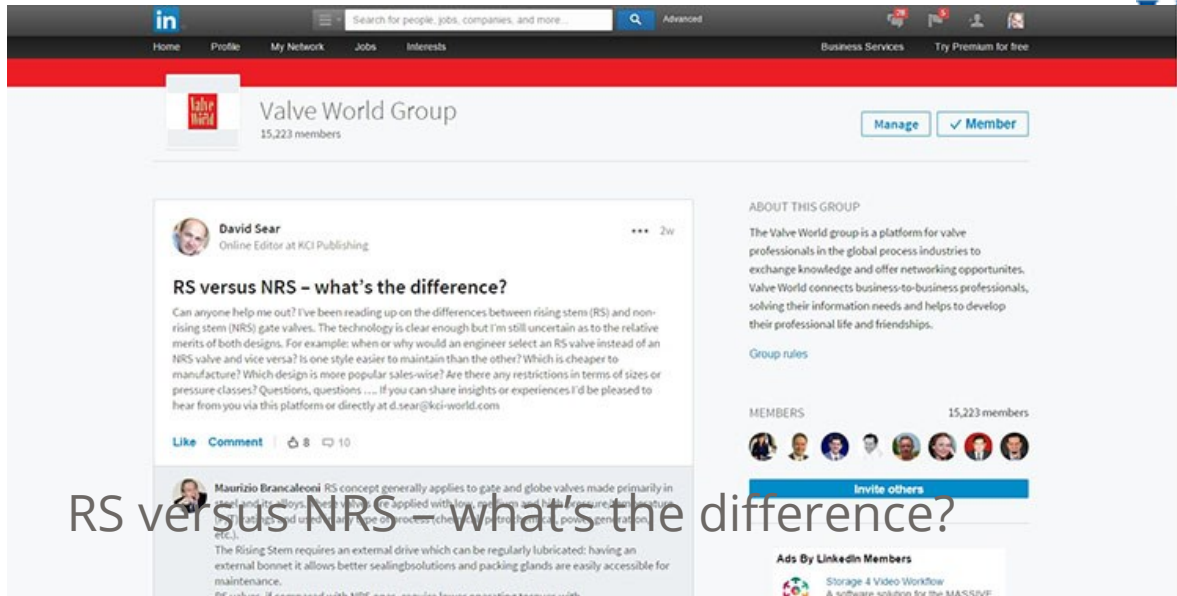
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RS versus NRS – what's the difference?

David Sear - 4 February 2016

To rise or not to rise – the Valve World LinkedIn Group has provided this particular editor with a wealth of insights into the merits of stem designs

In fact, the title of this blog was actually a question I posed a few weeks ago on the [Valve World LinkedIn Group](#). Why? Well, I'd been reading up on rising stem (RS) and non-rising stem (NRS) valves and, whilst the technology was clear enough, there didn't seem to be any information available about the relative merits of either system.

So in an unwavering quest for the truth – or perhaps because I'm just plain nosy – I thought I'd put out some feelers on our LinkedIn Group. And I'm delighted to say that my call for assistance was answered by quite a number of knowledgeable valve experts. Here's what I have learnt thus far.... First to comment was Maurizio Brancaleoni, who noted that the RS concept generally applies to gate and globe valves made primarily in steel and its alloys. "These valves are applied with low, medium and high pressure/temperature (P/T) ratings and used in

About the author



David Sear is Online Editor. He is contributing to articles, interviews and reports to KCI's magazines and websites. David also

any type of process (chemical, petrochemical, power generation, etc)," he said.

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Moving on to the differences, Maurizio noted that the rising stem design requires an external drive which can be regularly lubricated: having an external bonnet allows better sealing solutions whilst the packing glands are easily accessible for maintenance. He further added that RS valves require lower operating torques which brings technical/economical advantages for actuation (either manual or electric).

Maurizio concluded by saying that non-rising stems are primarily used on gate and globe valves made in cast-iron used that are mainly found in water applications with low pressure/temperature (P/T) ratings. NRS valves cannot be lubricated externally and require a higher torque.

Lijo Edassery Poly had a similar comment regarding actuation. He said that "if the customer requests pneumatic actuation we have no other way than choosing rising stem design. On other hand the requirements of thrust is very high for gate valve considering other valves. So the base design has to be suitable for rotary actuation system like NRS."

An historical context on the use of rising stems was given by Bob Kimpton, who said they make it easy to see from a distance if a particular valve is open or closed. He also noted another advantage of RS over NRS in that the stem/spindle threads are kept out of the media or fluid, thus preventing them from becoming filled up or eroded which can increase the likelihood of problems.

Swee Yan concurred with Bob about the visual benefits of an RS valve, but added that it can be easier to install a NRS valve if space is limited above the valve. "On the other hand, rising stem valves can be operated with a smaller force, are easy to lubricate and benefit from a wide range of possible applications," he said.

Juan Becerra said the first point to consider between RS and NRS has to be the service conditions, type of fluid contained, temperature, corrosivity, etc. He noted that NRS valve have fewer parts and tend to be cheaper than RS valves, adding that NRS valves are more popular in water/clean liquids with RS valves found in oil & gas and power services.

Meanwhile Karan Sotoodeh broadened the discussion by talking about OS&Y (Outside Screw and Yoke) and IS&Y (Inside Screw and Yoke). He also gave the good advice to start Googling, so that could be my next homework.

And finally, Сергей Киреев started that in his experience RS gate valves are the most used design, but commented that if the valve stem is broken in the wedge contact zone the wedge might fall and block the medium. He indicated he does use NRS valves as well but avoids them for critical service. "With NRS valves problems can include corroded threads that prevent proper valve closure and even result in broken nuts if excessive force is applied," he warned.

Now I'm a great believer in trying to learn a little something every single day so I am most grateful to all the experts for their insights. To be honest, I could not have asked for better replies and am fast becoming a LinkedIn advocate. Maybe the group is a platform for learning or even sharing for you as well?

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