We need clarity when testing valves

Valve tester Colin Zegers sees cause for concern when it comes to design validation testing

Colin Zegers is the owner of Industrial Testing and Inspection Services (ITIS) in Goes, The Netherlands. Their growth has led to a new testing facility, where they complete a wide variety of valve testing services such as type approval, production and fire safe testing. It is here where the ITIS team also carry out the renowned Shell MESC SPE 77/300 test (Shell Type Approval Test, or "TAT") nowadays known as the Design Validation Test (DVT) of industrial valves, which are normally valid for 5 years.

In fact, Shell have expressed – in a written statement in Colin's boardroom – their confidence in the equipment and expertise at ITIS to perform the Type Approval Test. It reads: "*During the execution of the Design Validation Tests, ITIS testing facility had the required equipment available to perform the seat testing, fugitive emission testing and operating torque measurement and appointed staff was knowledgeable to execute the testing in accordance with Shell MESC procedure SPE 77/300 Appendix C – Performance Validation.*"

As Colin explains, the DVT test (Appendix C) executed by ITIS covers the requirements and methods for evaluating the performance of industrial valves when they are exposed to the limits of their design conditions. The requirements, he says, establish the acceptable limits of a valve's performance, regardless of its size or pressure rating. "It is a type acceptance test that confirms a range of valve aspects such as seat sealing, fugitive emission performance and a valve's operating torque capability under pressure. It also tests these aspects during and after mechanical and thermal cycling." To ensure strict compliance a representative is required to be on site as an observer. "We have no partnerships with specific end users or suppliers" he says, "We have to prove our independence every day."

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However, there is more to the MESC SPE 77/300 test than meets the eye. "It encompasses more than what we do here at ITIS, which is just Appendix C. To be in full accordance one also has to acknowledge the steps before and after this appendix." This, he says, requires further investigation such as an audit of the foundry, an inspection of a supplier's facilities, and an investigation of the processes applied relating to ISO standards and safety. Further to this is also requires a mechanical specifications (MESC) test depending on type valve, class, size, service, specification, design pressure and temperature.

These additional elements, he says, are not always understood by some end users. "They don't see that we only provide Appendix C, a fraction of the whole SPE 77/300 procedure. Appendix C is a valve validation - it has nothing to do with the manufacturing validation of SPE 77/300.

When you pass a DVT it's the whole process and supply chain as well. We won't always have full insight into the foundry, the specifics of the design, the engineering, gaskets, stems, sealing and so on. Further, we have no assurance that other valves of the same batch have undergone the same exact steps." Mr. Zegers says it leaves him with some remaining questions: "What happens if the manufacturer changes their foundry? What if they change their engineering? Or replace parts here and there? How much detail should we ask of our clients? Do we follow the strict SPE 77/300 requirements? Do we have to visit the foundries?"

He observes: "Some end users ask for the 77/300 Appendix C test but label the valve to be completely in accordance with the MESC SPE 77/300 requirements. How valid does this then make our test report or certificate? Also consider that we are not even authorised to claim that a validation has expired. There is a danger of issuing a certificate which will become like issuing a driver's licence for someone who cannot drive a car. This is why, in my opinion, end users need to have a clear understanding of the MESC SPE 77/300 and issue detailed requests."