Alternative Valve Repacking
(Extraordinary Attempt to Repair)
Using the Drill & Tap Method to Repack Valves

The use of the Drill & Tap method for packing valves to complete repairs as part of LDAR programs or Consent Decree compliance is currently a major topic of discussion. The use of the Drill & Tap repair process has been used commonly in the Refinery, Petrochemical and Chemical plant sectors (Downstream) for more than 50 years. D&T repairs have been performed effectively and safely to repack valves of various types. One of the unique characteristics of a D&T repair is that it is performed under pressure with the line still in service, allowing the valve owner/end user to continue normal plant operations.

With more focus now being placed on the midstream market relative to fugitive emissions, the discussion regarding the use of the D&T procedure for leakage control in valves has become a prominent discussion topic. Even with the long history D&T repairs in the downstream sector, there is a tremendous amount of push back on its use in the midstream sector.

As a result of the concerns raised by many in the midstream sector with regard to the potential required use of the D&T repair method, a D&T forum was held during the 4C conference earlier this year. The purpose of the forum was to discuss the use of D&T repairs and its advantages and potential disadvantages to be considered. The US EPA was involved in the forum, playing a prominent role in helping to identify a list of questions to be posed to the expert panel of on stream repair company representatives. EPA LDAR Guide Drill & Tap Definition

Drill and Tap is a repair method where a hole is drilled into the valve packing gland and tapped, so that a small valve and fitting can be attached to the gland. A packing gun is connected to this fitting and the small valve is opened allowing new packing material to be pumped into the packing gland.

Many companies consider this a permanent repair technique, as newer, pumpable packing types are frequently superior to the older pack ing types they replace. Packing types can be changed and optimized for the specific application over time.

Sampling of Drill & Tap Forum Questions

1. Are end users/valve owners concerned with the valves operability once the Drill & Tap repair has been performed?
   Although this has been discussed, all of the representatives participating in the panel were in agreement that when performed properly, the valve is capable of being used after the repair just as it was prior to the D&T being performed.

2. Is valve metallurgy or manufacturing type (Cast vs. Forged) a concern when drilling into potentially high pressure applications commonly seen in the Midstream/Upstream processes? The repairs are performed based on criteria provided with regard to valve materials and design.

3. Could the use of X-ray be considered as a preliminary process needed prior to performing a Drill & Tap repair on valves installed into the process applications? This is definitely a means of upfront inspection and something to be considered if required by the user. In addition to the use of X-ray, NDT would also be an option to verify wall thickness prior to performing the D&T.

4. Is there a concern that the injectable material being used could have petroleum based lubricants added that could gas off causing false emission readings to occur? This something that should be considered when developing and selecting an injectable packing to be used for the repack of valves required to comply with Low E mandates.

5. Would there be a need to perform testing similar to API 622 (injectable) on the injectable packing materials which would include leakage performance below 100 ppm, corrosion and weight loss testing as required on standard graphite valve packing for Low E sealing? When reading the Consent Decree definitions for valves and packing, it is stated that the valves and packing must have a warranty/guarantee shall be backed up with "Testing pursuant to

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Good Engineering Practices”. Knowing this is a requirement of the original equipment (valve & packing); it seems to only make sense that injectable packing should be subjected to similar testing to ensure compliance.

6. Would the use of an injectable packing require the five year warranty/guarantee commitment written into recent Consent Decree definitions for Low E packing? Currently there is no longer requirement for a warranty/guarantee for a D&T. However, the use of a D&T is required if a valve that is found to be leaking cannot be brought below the leak definition threshold by merely tightening the gland flange bolts.

7. Should valve manufacturers consider testing their new valves with injectable packing and fittings as an additional option for End Users to consider when purchasing valves to be used in applications to be monitored as part of LDAR programs or Consent Decrees? With the publication of API 624 and the requirement to comply with API 624 as part of API 600 and API 602, the future may dictate the need to validate valve performance with injectable packing.

8. Should the installation of an ASME designed injection fitting be considered when designing these valves? Many API 6D valves are manufactured with an injection port designed and manufactured into the valve. Knowing this, the next step may be the consideration of having the same option available for other valves being used.

9. Have any of the companies who provide Drill & Tap Repair services tested their injectable packing and injection fittings installed on valves as a leak control solution, to validate the ability of these materials to work as Fire Safe materials? The use and selection of injectable packing is based on the process being sealed. With regard to testing of the injectable products, none of the panel members offered any data with regard to testing they have had performed on their products.

10. Do drill & Tap Repairs perform better on one valve type versus another work better? (Example: Gate or Globe Rising Stem valves in comparison to Ball or Butterfly Quarter Turn valves) The panel was in complete agreement that D&T repairs are performed on all types of valve excluding Control Valves. Additionally, Consent Decrees exclude the requirement of D&T repairs on Control Valves, but, beyond Control Valves no other valve types are excluded. To answer the question specifically, the panel was in agreement that the use of D&T repairs was basically the same from valve type to valve type as long as the valve had the standard packing configuration required for a successful repair.

Conclusion

The use of D&T repairs is here to stay. The EPA continues to include the required use of D&T repairs as part of the compliance requirements. Knowing this, it seems obvious that we should work to advance the products being used and the processes by which they are used to offer the users a comfort level with regard to the viability of the solution with regard to its effectiveness while remaining a safe option for all involved.

The ultimate goal for all is to meet the requirements and mandates being doled out by the US EPA and other state air quality groups. In addition to meeting the compliance requirements, we must also be sure to leave valves operable to afford the users continual operation of their facilities simultaneously. This is possible with a concerted effort to work together between valve manufacturers, packing manufacturers and injectable manufacturers.

Compliance is a major issue we should all be working to help our customers with and to do this well those of us who may have not worked together in the past may have to find ways to work together in the future. The use of D&T is very prominent in the downstream sector and now being pushed heavily into the midstream sector. The use of D&T is not going away and because we all know this and should have some level of understanding with regard to D&T, we should embrace its use and find ways to make it as effective as possible.

About the Author

Rodney is responsible for A.W. Chesterton’s (AWC) Global OEM Valve program, AWC’s Knowledge Provider Program for Stationary Equipment/Consultative Technical Services and AWC’s Strategic Accounts Initiative.

Rodney has over 25 years of experience in the manufacturing, design, R&D, engineering, sales and marketing of stationary sealing solutions to include packing and gaskets. Rodney has extensive experience in the recommendation and design of engineered sealing solutions for use in all types of valve and flange applications with a focus on Low E sealing technology for valves and large diameter critical flange sealing.

Rodney works very closely with valve manufacturers to help enhance their valve designs to ensure they meet EPA guidelines and definitions for “Certified Low Leaking Valve Technology” and “Certified Low Leaking Packing Technology” to meet Enhanced LDAR & Consent Decrees and compliance.