



Mini Grouted Tee

Value Tracking Case Study



Mini Grouted Tee

Background

The National Transmission System (NTS) contains several thousand valves, a number of which are affected by corrosion. The location and age of the valve, in addition to environmental factors, can cause corrosion to develop on the vent and sealant lines attached to the valve.

Where corrosion is more advanced, the valve would be removed and replaced as no viable repair solution existed. Replacement of a valve requires isolation, excavation, venting and recompression. This process is extremely costly, takes several months and has environmental and safety impacts.

What's new?



Figure 1 - Existing Epoxy Repair clamp



Figure 2 - Existing Grouted Tee technology

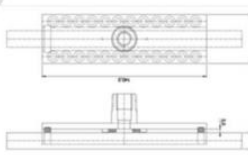


Figure 3 - Proposed sealant line Grouted Tee design

A solution was proposed whereby a small Grouted Tee connection is attached to the sealant line pipework below the squeezed off location. It should be noted however that the tee connection should be located on a sound section of pipework without severe pitting or any deformation. The tee connection will allow access into the pipework to isolate the leak path and enable the remaining pipework to be modified or replaced. Additionally, this technique will also provide an encapsulation solution to the sealant line compression fittings that are susceptible to leakage. The new design of

fitting will be based on existing technology, shown in Figure 1 to Figure 3 below and qualified to conform to the higher pressures that are applied to sealant lines during the sealant injection process

The benefits

The benefit of using the mini grouted tee is to avoid shutdowns, mitigate impacts on our customers and lowering potential increased expenses as a way of decreasing a company's future costs.

Financial savings

The mini-grouted tee significantly cuts the time and cost involved in repairing valve and sealant lines. The successful repairs of the three valves at Kings Lynn Tee removed the need to replace the valves, cutting costs by £817k. The environmental impact of removing and replacing valves is also significantly reduced. With the traditional approach, gas in a high-pressure pipeline (70 bar +) would be removed to make sure the work could be done safely. As the gas can only be recompressed to 7 bar, any remaining gas would be removed by venting. The mini-grouted tee allows technicians to carry out repair works safely while the gas remains live in the pipeline - completely avoiding the need for recompression and venting of gas, and the associated carbon emissions. The customer benefits too with no disruption to service while the repair work is carried out.

Implementation

The small diameter Grouted Tee (SDGT) has been designed in accordance with the principles and concepts of T/SP/P/22. This specification provides guidance on the requirements of the materials, manufacture and inspection of epoxy grouted shells designed to repair pipework between 14 and 60mm nominal outside diameter. The design



pressure for these fittings is limited to 100 Bar except for the 14mm pipework that is used for valve sealant lines. The design pressure for the 14mm sealant lines is limited to 690 Bar, therefore the development SDGT was designed to accommodate the 'worst case' smallest diameter and highest pressure 14mm pipework installations. The programme has concluded by providing business ready, fully qualified designs for various SDGT configurations. These fully qualified SDGT connections will allow safe and efficient access into the sealant pipework to isolate the leak path and enable the remaining pipework to be modified or replaced. Additionally, this technique will also provide an encapsulation solution to the sealant line compression fittings that are also susceptible to leakage. The new design of fitting was based on existing technology and qualified to conform to the higher pressures that are applied to sealant lines during the sealant injection process.

The technique is available from National Gas Transmission via the Pipelines Maintenance Centre, Ambergate.

