



Kinetics Controls & Innovation Ltd

Case History

North Sea Platform Gate Valve Stem Isolation

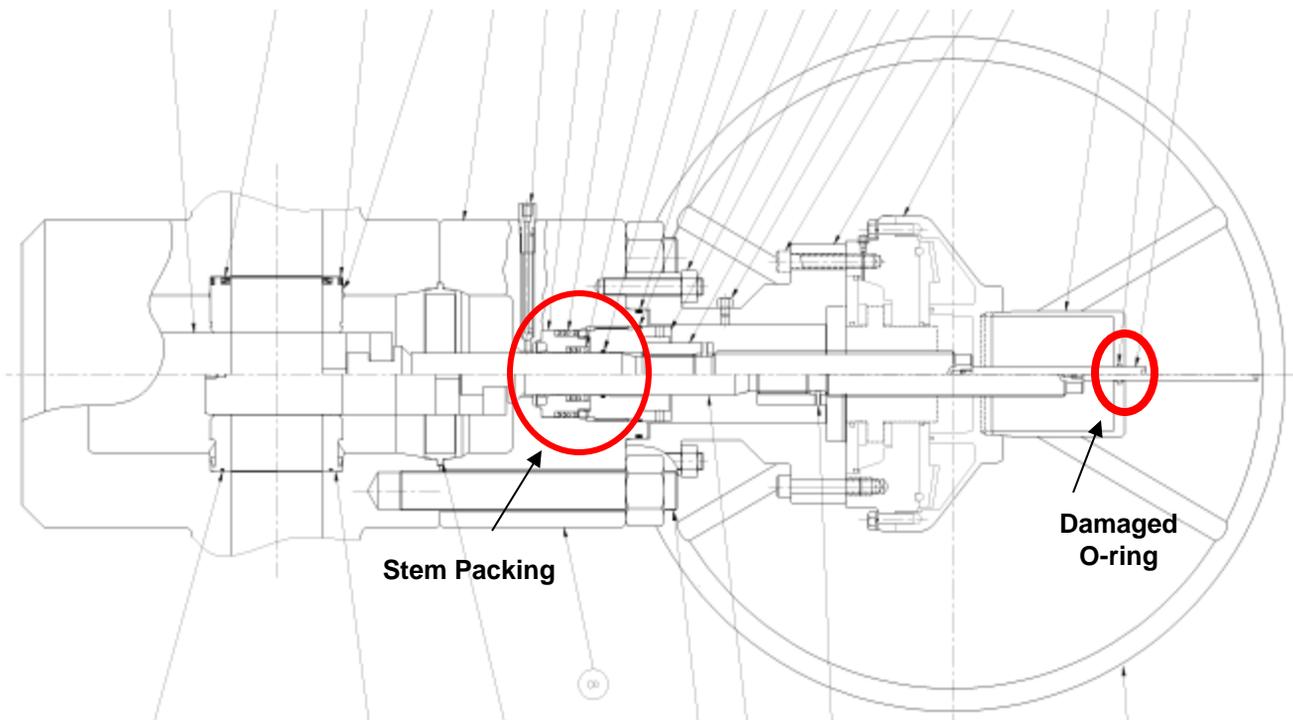
The following is based on limited information at the time of this evaluation:

History / Introduction:

Indications are that well pressure has passed through the stem packing into the gearbox. The O-ring that supports the rising stem was extended allowing trapped pressure to escape. The pressure relief fitting had not activated. Indications are that grease may have migrated past the stem packing preventing the relief valve from activating.

The well is a gas producer and indications are the dry internal atmosphere may have contributed to the packing failure. To be confirmed.

KCI offers an option in providing a temporary isolation to obtain safe access and provide a long term high / low temperature lubricant which will prevent further stem packing damage.



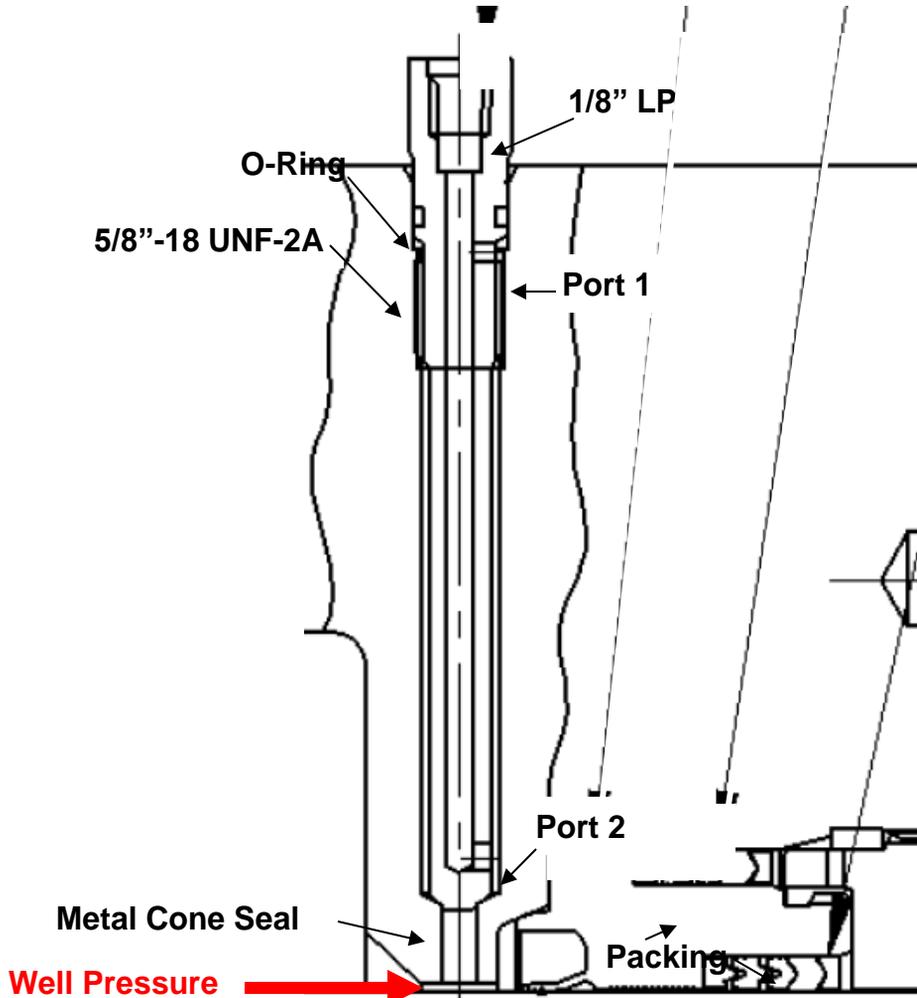


Model 'D' Fitting:

The model D fitting requires to be screwed back **2 turns** anti-clockwise to gain communication into the cavity between the back seat and stem packing. Test ports, of which there are 2, which are positioned below the o-ring and above the cone seal.

This fitting is normally used to inject grease into the valve cavity and lubricate the stem packing.

The o-ring is critical in maintaining the primary barrier when the cone seal is off seat. A pressure test of the o-ring can be achieved prior to opening the access port i.e. cone seal.





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Vetco testing of the o-ring

If the o-ring test fails, Install / incorporate the KCI Mac-Pac deployment tool with the existing Vetco manifold.

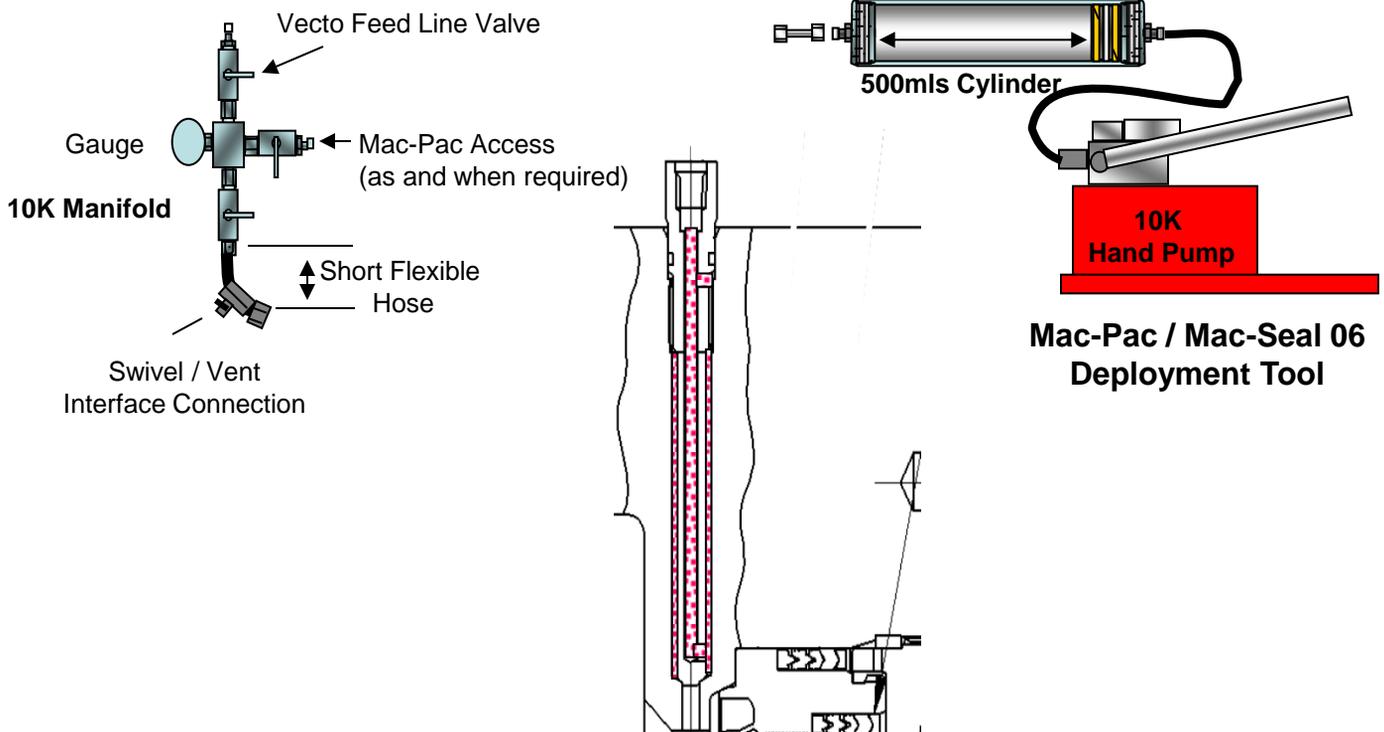
Isolate the Vetco feed line (Valve closed) and open the Mac-Pac feed line (valve Open).
Inject the Mac-Pac which will displace the existing fluids through the o-ring leak path.
Build and maintain **5,000psi** and hold for 15 minutes.

If test is good, bleed / vent test pressure.

Unseat the Model 'D' fitting and monitor to confirm stem back seat is good.

Close the Mac-Pac manifold valve and remove the Mac-Pac deployment tool.

Follow Chevron procedure.





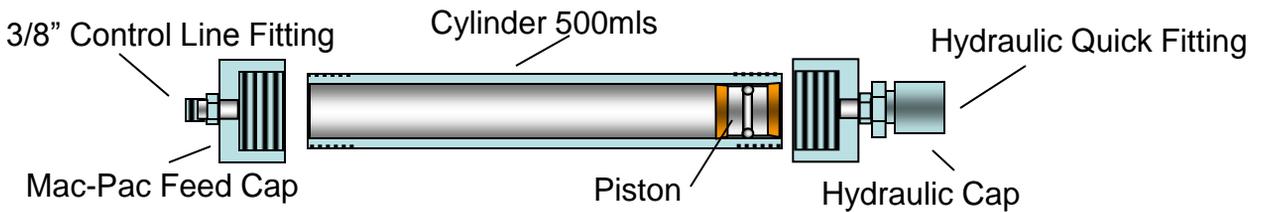
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Mac-Pac Sealant:

KCI Mac-Pac is a highly viscous fluid which will energise existing damaged seals. The Mac-Pac sealant will maintain and increase its viscosity within a confined cavity (subject to the size of the leak path). The Mac-Pac will pass through the leak path and position a top-load seal structure against injection gas pressure. The Mac-Pac will pig out all of the existing fluids within the cavity. The Mac-Pac has an operational temperature range of -50° to 250° C with no change to the products viscosity. The Mac-Pac can be flushed and replaced by Mac-Seal 02 if required.

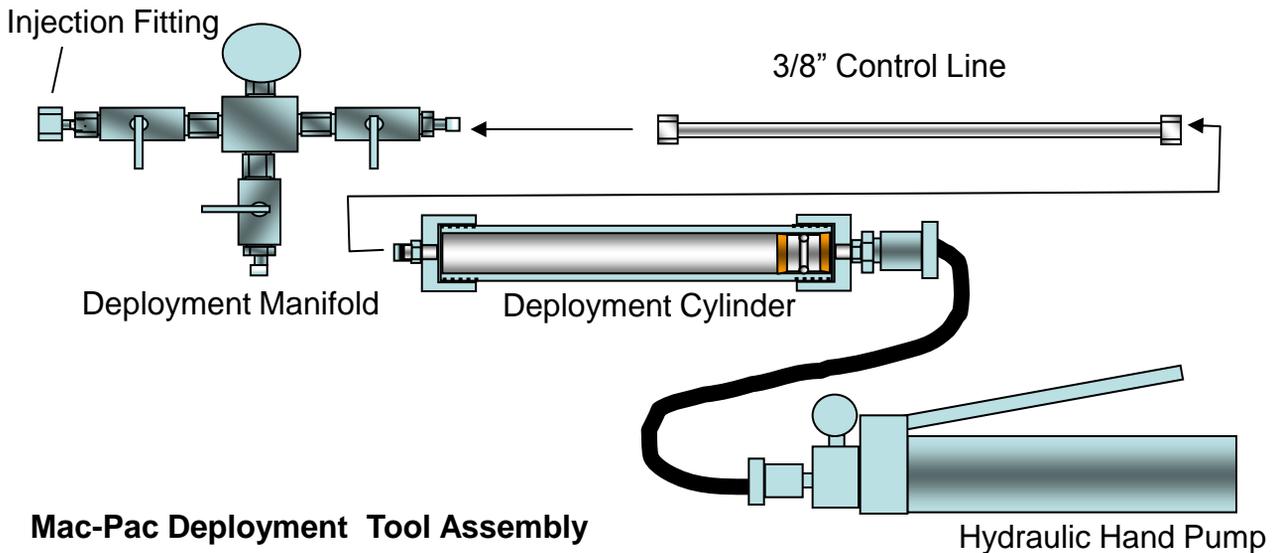
Tooling:

Mac-Pac deployment tool 500mls stick.



Deployment Tool

Note: When deploying more than 500mls of Mac-Pac (stick) swap cap ends and remove the oil and install the additional Mac-Pac stick. The piston will come to a mechanical stop with an instant build up of pressure indicating end of piston travel. Always bleed down the hydraulic oil pressure before removing the cap.



Mac-Pac Deployment Tool Assembly

Hydraulic Hand Pump