In-Service Condition of CAMERON® D/DL Annular BOP Packing Element Subassemblies

Purpose

To provide information on visual condition and capability of CAMERON Type D/DL Annular BOP Packing Element Subassemblies

Details

The elastomeric packing elements used in CAMERON type D/DL annular blowout preventers are considered to be consumable items and will eventually wear-out as a result of repeated closures and pressure test. Every closure and pressure test while in-service will use up some of the packing element life. The packing element subassembly should not be rejected for continued service based on cosmetic appearance. Failure of a pressure test or drift test are the only justifiable reasons for rejection.

Initial API 16A qualification testing of the annular packing element involves fatigue testing. This testing involves repeated closures (364) and pressure tests (52). After every 20th closure, the ID of the packer is measured and recorded for 30 minutes. Cameron has revised this procedure and requires the packer to pass a specific size drift within 30 minutes after every 10th pressure cycle.

Before any newly manufactured packing element is shipped from Cameron to a customer, it must pass an API 16A certification test involving closure on open hole, pressure testing on drill pipe, and finally a drift test. Open hole testing consists of several closures on open hole followed by a pressure test on open hole at one half of rated pressure. The next step in certification testing involves closing on either a 3-1/2" or 5" drill pipe and testing to the rated pressure of the annular BOP. The final test is a drift test to determine if the packing element will fully open within 30 minutes.

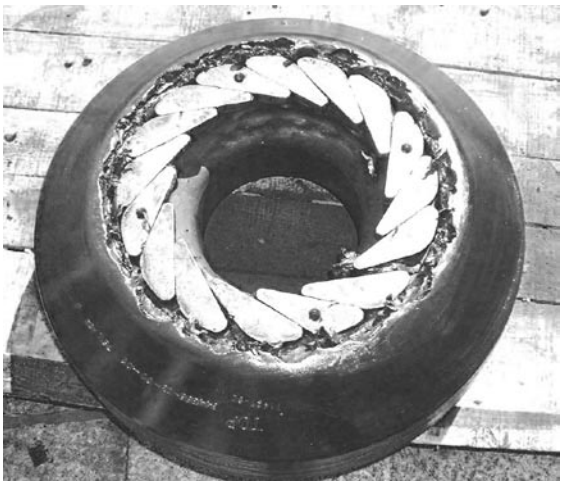
D annular BOP operating pressure plays a role in annular packer life. Recommended operating pressure is in the range of 1500 psi to 3000 psi. If sufficient operating pressure is not applied to close the BOP, the metal inserts (anti-extrusion elements) will not be in a position to prevent elastomer extrusion when pressure is applied to the wellbore. Therefore, a minimum operating pressure of 1500 psi shall be used. If leakage occurs at 1500 psi, the pressure may be increased up to 3000 psi to eliminate the leakage.

One photograph (see pg. 2) shows a 7-1/16"-10,000 psi rated packing element subassembly after completing the API 16A 2nd Edition fatigue test. While the packer and donut show some signs of materials loss, they are suitable for continued service because they did not leak during the pressure test. The other photograph shows another 7-1/16"-10,000 psi rated packing element subassembly after approximately 20 full rated pressure test. Again, while some material has been lost, the packing element successfully tested on a 3-1/2" drill pipe mandrel at rated pressure and is therefore suitable for continued service.

Annular packing elements do not fail catastrophically. They will gradually lose elastomer in the packer throat area with continued use and eventually fail to hold rated pressure, even with increased operating pressure up to 3000 psi. When this occurs, it is time to replace the packing element subassembly.

For additional information contact your local Cameron Representative or nearest CAMSERV facility.

After 364 closures and 52 pressure tests



After approximately 20 pressure tests

7-1/16”-10M Annular Packing Element Subassembly

Both of the above packing elements are suitable for continued service because they successfully completed pressure testing and drift testing. The cosmetic appearance of the packer throat and top of the donut in no way reflects the operational capability of the packing element subassembly.

New production packing element subassemblies, which have successfully completed the API certification test, will show some signs of nibbling on the top of the donut. This is an indication that the packing element subassembly has successfully completed the API 16A 2nd Edition certification test. This testing is a quality assurance provision required by API and in no way effects the service life of the delivered packing element subassembly.

For additional information contact your local Cameron representative, nearest CAMSERV™ facility or email flexpackernr@camerondiv.com

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