

CASE HISTORY

7" Tubing Shear Ram Connection Leak Repair

JOB RECAP: 4 July 2007
Company: Statoil
Location: Offshore Norway

OBJECTIVE:

Repair Leak via the Tubing Shear Ram (TSR) Annulus using SEALMAKER International sealants to penetrate and cure a tubing thread leak in the 7" Shear Sub's lower thread connection above the casing hanger to eliminate communication between the injection tubing and the TSR annulus.

LEAK DESCRIPTION PROVIDED BY STATOIL:

New tubing installed in well.

During installation tests leakage between upper/lower tubing hanger (leakage between tubing and TSR annulus) were observed and verified. Leakage assumed to be in connection of shear nipple (7" 29# Vam Top, 25Cr) between the hangers.

Leakage tests that have been performed:

(1) Leakage from TSR annulus to tubing:
(345-165 bar) / 30 min = 165 bar / 30 min = 6 ltr/min

(2) Leakage from tubing to TSR annulus:
(260-100 bar) / 60 min = 160 bar / 60 min = 2,7 ltr/min

SUMMARY:

The well was successfully repaired and returned to service using the **SEALMAKER International Pressure Activated Sealant** on 4 July 2007. After running pre-job diagnostics the TSR Annulus leak was verified to be leaking at the rate of 30 bar/min from 345 bar. Complete leak-off to zero (0) occurred in 50 minutes.

The repair was performed by first injecting 120 Liters SEALMAKER™ to fill the TSR annulus. The TSR was then pressurized to displace sealant into and through the leak. Partial sealing immediately occurred and the leak rate was slowed to 3 bar/min at 345 bar but leak-off continued to occur at 345 bar. A stabilized seal was established at 150 bar. The leak was then shut in and allowed to cure for 12 hours. Additional sealant was then injected and the seal pressure was increased to 232 bar over the next 12 hours. Again the leak was allowed to cure for 12 hours with no leak off. The pressure was then raised successfully to 345 bar. After reaching 345 bar, the TSR annulus pressure was then cycled 6 times from 345-0 bar to verify seal integrity. After confirmation that seal was intact and stable at 345 bar, the TSR annulus was then pressure tested overnight (12-hours) with zero pressure loss. The well was then inflow tested under normal flow conditions with no pressure build-up into the TSR, showing the ability of the SEALMAKER™ Sealant technology to provide stability in both directions against sustained pressure. The well was then returned to service.

STATOIL