

USE OF PRESSURE ACTIVATED SEALANT TO REMEDIATE WELLBORES

Dean Checkai, Gerard Osborne, Gary Webb, Bob Murray
Fluor Federal Petroleum Operations
Seal-Tite International

1.0 Abstract

Pressure-activated sealant has demonstrated to be a cost effective wellbore remediation technique to fix wellbore liner casing shoe leaks and to reduce gas migration behind cemented liners. Three wellbore case studies are presented. A recommended application procedure for sealant injection, placement, curing, testing, and recovery is provided. In each of the three case studies, the wellbore had failed a Mechanical Integrity Test (MIT) prior to sealant injection. After executing the sealant procedure, two of the three wellbores passed their respective MITs. Improvements to the procedure were made during consecutive jobs in order to improve efficiency. In the subject crude oil storage cavern wells, an oil sample is taken and oil density is determined to confirm the lighter density sealant will float on top of the oil. Low nitrogen injection rates prevent sealant breakup as it moves down the oil annulus. Nitrogen-sealant interface detection using a wireline density tool allows for proper sealant placement across the leak site. Cavern pressure versus time is analyzed to determine effectiveness of sealant injection and curing. Cycling of the nitrogen-sealant interface across the leak site encourages sealant penetration. The sealant is positioned at the deepest casing shoe before entering the salt borehole chimney. Proper use of sealant on a cemented liner shoe demonstrates the ability to withstand nitrogen gas pressure under test conditions. In addition, there is a significant reduction in sustained casing pressure buildup (SCP). MIT data from before and after sealant application demonstrates the effectiveness of the treatment, allowing the wellbore to be returned to service.

Key words: Sealants, Casing Shoe Leaks, Sustained Casing Pressure Buildup, Wellbore Remediation.