Schlumberger

North Sea Operator Saves 2–3 Days of Rig Time on P&A

CemFIT Heal cement system delivers long-term isolation around gauge cables, enabling operator to leave the tubing in the well

To meet design requirements for permanently abandoning a well, an operator found that CemFIT Heal* flexible self-healing cement system can seal and isolate a well—even around gauge cables—over the long term, resulting in rig time savings valued at GBP 400,000 to 600,000.

The operator's concerns

Retrieving the 5½-in production tubing during plugging and abandonment operations adds operational complexity and costs, and increases exposure to HSE hazards. Through-tubing cementing around gauge cables increases risks that leak paths could form over time.

What they tried first

The operator's scientists developed a novel testing apparatus to evaluate cement systems for P&A and zonal isolation applications, determining that unmodified Class G cement and a blend containing metal oxide–based expansion material delivered acceptable isolation performance for normal abandonment operations. However, ongoing experimental work suggested that enhancements to the conventional systems would be beneficial for sealing.

What Schlumberger recommended

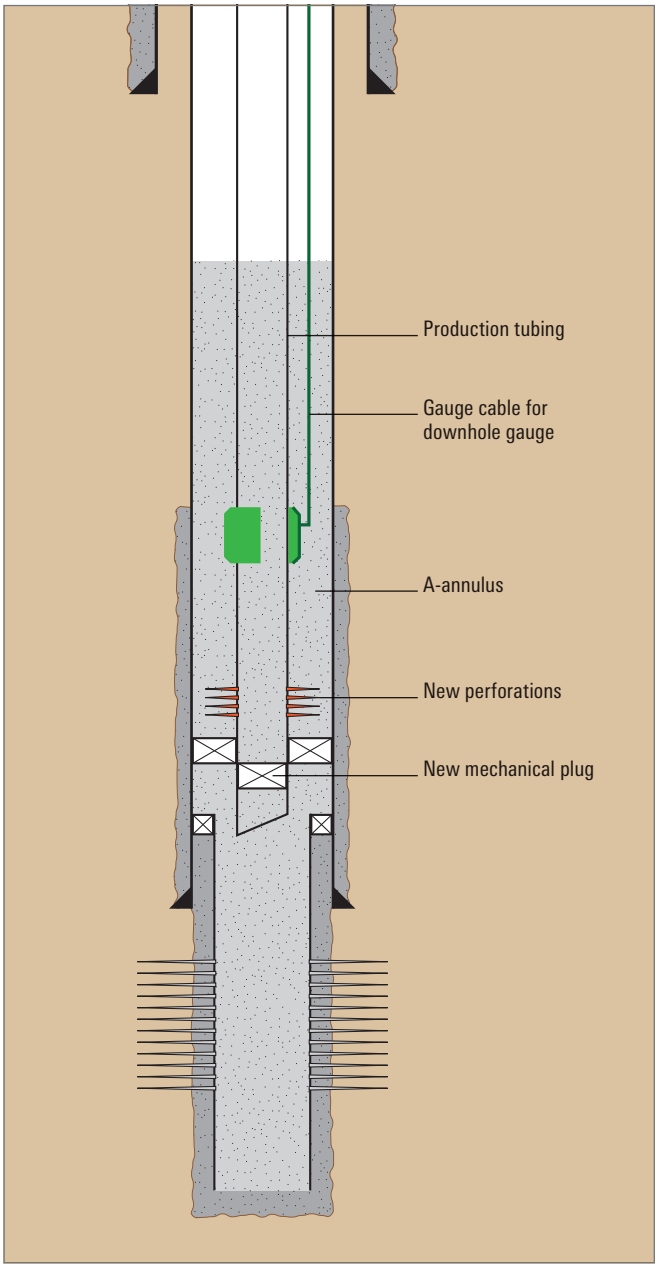
CemFIT Heal system expands to seal microannuli after setting, has a low Young's modulus to withstand normal wellbore stresses, and repairs itself upon contact with oil or gas that may seep through any isolation defects that may occur later in the life of the well.

How the operator achieved long-term isolation

Operator testing determined that the optimal CemFIT Heal system performance with the gauge cable in place achieved the design requirements and minimized risks. This gave engineers confidence that the system was fit for purpose and that the presence of the gauge cable would not compromise the abandonment.

In operation, a cement plug of CemFIT Heal system was pumped through the production tubing and squeezed into the perforations to create a permanent barrier across the reservoir section. Next, a mechanical plug was set inside the production tubing and the tubing perforated to provide access to the A-annulus. A balanced plug of CemFIT Heal system was then placed, and after 30 h, the plug passed a 500-psi pressure test.

The operator estimated the operation saved 2 to 3 days of rig time, valued at approximately GBP 400,000 to 600,000. The operator also avoided the risk of leaving the well on long-term suspension with mechanical plugs while waiting for a rig to complete the isolation, and the operation minimized the number of intervention steps required for abandonment, thereby limiting scope growth.



The sealing ability of the CemFIT Heal system gave a UK operator the confidence to abandon a North Sea well without pulling the production tubing and gauge cable, saving 2 to 3 days of rig time and approximately GBP 400,000 to 600,000 per well.

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