

Operator Eliminates Sustained Casing Pressure in Injector Well

Remedial cementing with CemFIT Heal system and expanding agent restores integrity to 17-year-old well, enabling injection to resume, Prudhoe Bay

After inconsistent success with conventional remedial cementing, an operator found a flexible, self-healing solution for sustained casing pressure (SCP).

Restore integrity to a water injector well

Dozens of injector wells in Prudhoe Bay have experienced SCP in the annulus between the production casing and completion tubing. At the end of 2018, well PSI-09, a 17-year-old gas cap water injection well, failed a mechanical integrity test, and a leak detect log found a production casing leak at 7,441-ft MD. The operator needed to restore the well's integrity to resume reservoir pressure management.

Avoid conventional remedial cementing

Remedial inner annulus cement placement has been the operator's conventional solution for SCP in the field, but performance has been inconsistent. Some wells resume SCP immediately after remedial cementing, while others pass initial pressure tests only to experience failure or repressurization months or even years later. This led to the theory that in some wells, the cement sheath failure occurs as a result of wellbore stresses, such as postplacement temperature and pressure variations, over the life of the injector well.

Design a flexible, self-healing cement system

Schlumberger recommended a remedial squeeze of CemFIT Heal* flexible self-healing cement system with D174 expanding agent. CemFIT Heal system has low Young's modulus to improve flexibility under well stresses and self-healing capability that enables it to heal cracks or microannuli after contact with hydrocarbons. The D174 agent helps prevent early microannulus development.

Eliminate sustained casing pressure and resume injection

To eliminate the need for a rig and ensure precise placement and squeezing, the CemFIT Heal system was designed with laboratory support to suit the well temperature and pressure conditions and the operational considerations of coiled tubing (CT) delivery.

The cementing operation was executed as planned through CT and the cement allowed to set. The well then passed integrity pressure testing criteria set by the local regulatory agency, and a subsequent waterflow log found no out-of-zone injection.

The PSI-09 well was put back online as an injector less than a month after the successful CemFIT Heal system treatment.



The operator managed SCP in a challenging field with a CT squeeze of CemFIT Heal system, which has high flexibility under stress and an ability to heal any cracks that form.

"PSI-09 is definitely a success story. The well has been on injection since August [2019]. Please pass our compliments to the [Alaska North] Slope team as well as everyone involved with testing."

Cementing technical specialist