

Operator Defines Best Completion Plan for Depleted Sand, Deepwater Gulf of Mexico Well

Invizion Evaluation well integrity evaluation service integrates drilling, cementing, and logging data, generating comprehensive well integrity analysis to aid in completion plans

CHALLENGE

Confirm zonal isolation and top of cement (TOC) in the 7¾-in liner section of a deepwater well with depleted sands.

SOLUTION

Use Invizion Evaluation* well integrity evaluation service to evaluate conditions and identify possible remediation areas.

RESULTS

Optimized the completion strategy aided by an integrated advanced interpretation of the state of zonal isolation with computed sonic velocity, a density map, and centralization from the third-interface echoes.



Operator needed to evaluate well integrity in high-pressure deepwater well

The largest, most complex field in the Gulf of Mexico is also the largest deepwater producing asset in the world. With water depths exceeding 5,700 ft [1,737 m], reservoir temperatures up to 230 degF [110 degC], and pressures up to 17,000 psi [117 MPa], every detail involves careful planning, coordination, and execution.

In one deepwater well, the operator ran and cemented a 7¾-in liner to final depth with no fluid losses. However, after the job, a simulation run using CEMENTICS* zonal isolation software indicated that the cement at the shoe of the string had been contaminated with mud. Before proceeding, the operator needed to verify the actual cement barrier placement.

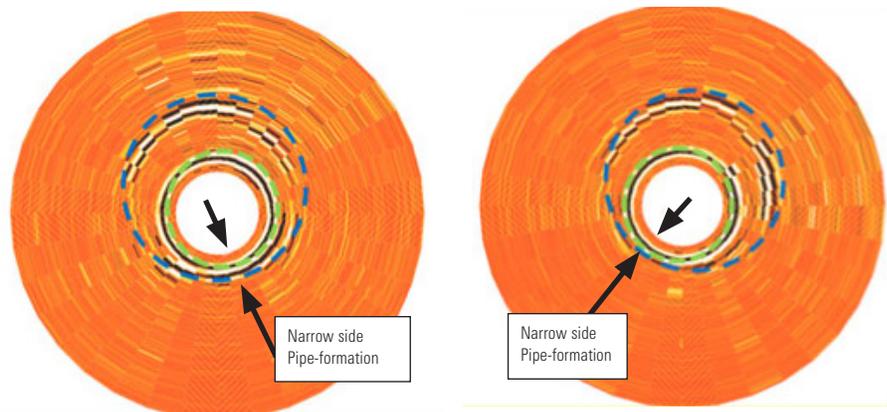
Innovative well integrity evaluation service integrated data to confirm cement placement

Schlumberger ran Isolation Scanner* cement evaluation service and Sonic Scanner* acoustic scanning platform from 23,606-ft [7,195-m] to 19,237-ft [5,863-m] MD. The logs showed TOC at 21,409-ft [6,525-m] MD. High acoustic impedance values and low flexural attenuation correlated to high-density solids behind the casing. However, a gradual decrease in readings suggested contaminated cement in the lower part of the section.

Using Invizion Evaluation well integrity evaluation service, Schlumberger calculated velocities from the third-interface echoes to identify the areas where the fluids had been overdisplaced or contaminated, leading to poor bonding. The third-interface echoes' reflections also suggested that the pipe was not centered in the annulus, leaving inconsistent patches of cement from 23,050- to 23,150-ft [7,026- to 7,056-m] MD.

Operator identified zonal isolation issues and mitigated future impact

The Invizion Evaluation well integrity evaluation service generated a comprehensive report that enabled the operator to pinpoint zonal isolation issues that could affect long-term well integrity. Following the advanced well integrity interpretation, the drilling and completions teams worked together to plan an efficient completion strategy for the well.



Third-interface echo cross-plots at the cement patch sections.