

Advanced Multidisciplinary Cement Evaluation Verifies Barriers and Saves 2 Days of Rig Time

Invizion Evaluation service integrates drilling, cementing, and logging data to generate comprehensive well integrity analysis, deepwater Gulf of Mexico

CHALLENGE

- Minimize risk of losses during fluid circulation.
- Confirm annular cement placement and condition to meet regulatory requirements.

SOLUTION

Use Invizion Evaluation* well integrity evaluation service for advanced cement evaluation in combination with data acquired using the USI* ultrasonic imager and Sonic Scanner* acoustic scanning platform to determine top of cement (TOC).

RESULTS

- Saved operator two days of rig time and confirmed TOC at 15,269-ft MD [4,654-m MD].
- Optimized the planning and abandonment program for the well in advance.
- Eliminated wireline runs on the subsequent two sections.



Subsalt section creates challenges for deepwater GOM floating rig

An operator on a deepwater floating rig in the Gulf of Mexico (GOM) faced challenges in a subsalt section due to the potential presence of reverse pressure trends, rubble zones, and loss zones. Based on the well requirements to reach the target, the well construction plan included a 14-in casing inside of a 16-in liner, which created a tight annulus.

Given these job conditions, which included losses, lack of centralization, and the presence of compressible drilling fluid used for drilling and cementing this subsalt section, the conventional interpretation of surface pressure match and volumetric calculations was insufficient to confirm the barrier placement in the annulus. The operator was required to verify that a specific length of cement was placed above defined permeable formations before proceeding with drilling ahead and prior to well abandonment.

Comprehensive well integrity analysis performed using integrated drilling, cementing, and logging data

Schlumberger recommended the Invizion Evaluation well integrity evaluation service's robust workflow, which combines specialized experience from domain experts with data correlation using tools and services from multiple areas of well construction. The integrated data is used to determine the wellbore quality, confirm cement design and placement, and provide cement evaluation.

Acoustic impedance readings from the USI ultrasonic imager showed a density increase at 15,269-ft MD. The discriminated cement bond log (CBL) attenuation also showed an abrupt spike in sonic response, correlating with stronger formation arrivals observed in the Variable Density* log at this depth. These observations confirmed the TOC at 15,269-ft MD with possible traces at approximately 15,200-ft MD [4,633-m MD].

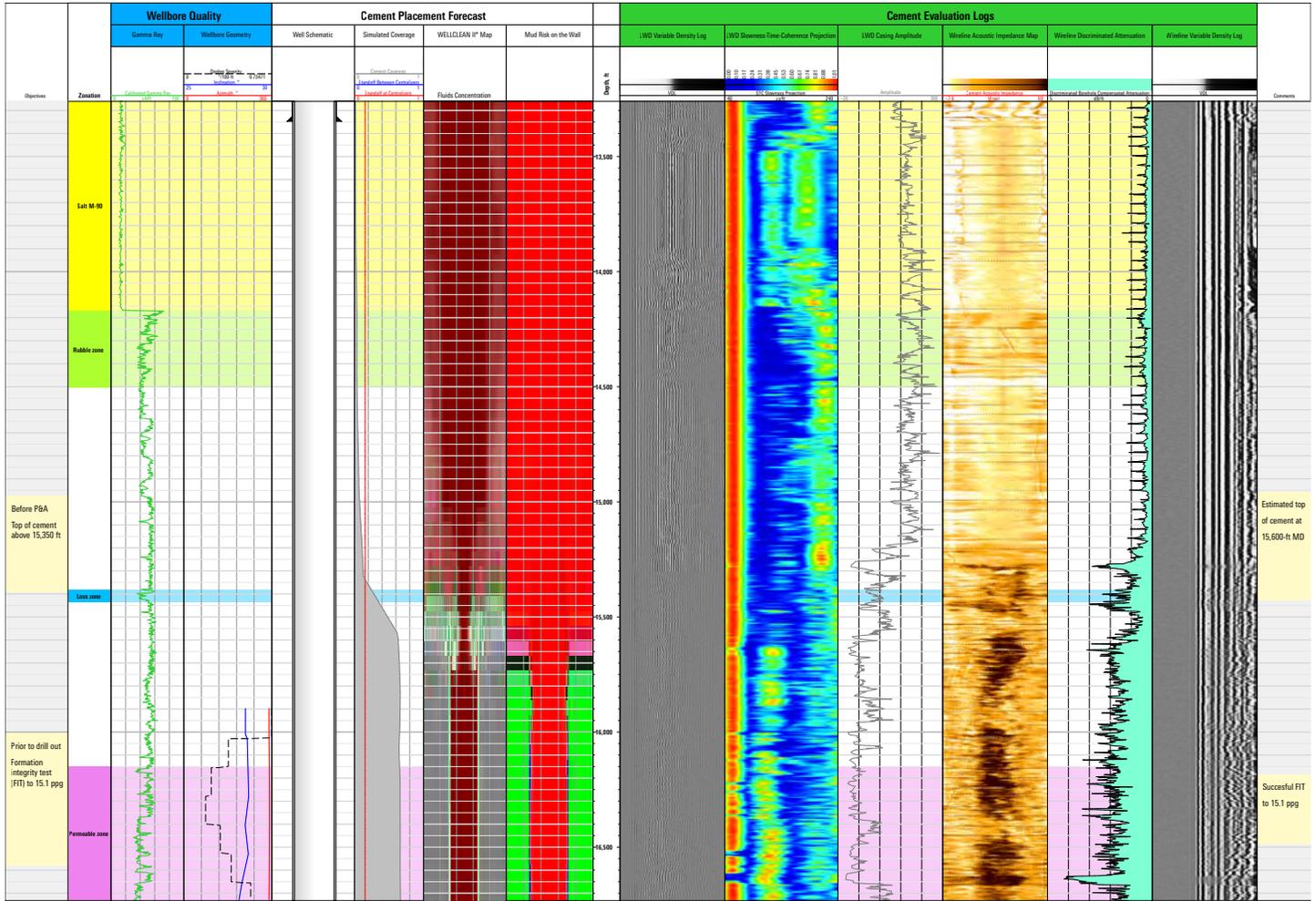
Sonic wave analysis indicated clear casing arrivals above 15,250-ft MD [4,648-m MD], which is indicative of no solids present above this depth. A partial appearance of compressional wave arrivals below 15,200-ft MD suggested the presence of solids (cement) behind the casing below 15,200-ft MD.

Below-TOC separation between minimum and maximum acoustic impedance suggested a nonhomogenous distribution of the slurry. This is shown in the acoustic impedance map that displays the azimuthal coverage of the cement placement. Cement placement is identified as primarily on one side of the casing, which correlates with Invizion Evaluation service's cement placement simulation.

Invizion Evaluation service verifies barrier to eliminate wireline runs in two sections

The accurate barrier verification provided to the operator satisfied both internal and external reporting requirements. The analysis by the Invizion Evaluation service was used to optimize the planning and abandonment program for this well in advance. The data was also used to better understand the optimal depth to sidetrack for both wells. Intelligence obtained by comparing LWD data interpretation with analysis of the Sonic Scanner platform and USI imager logging enabled the operator to eliminate wireline runs on the subsequent two sections, saving two days of rig time.

CASE STUDY: Invizion Evaluation service confirms TOC and saves 2 days of rig time using integrated data, deepwater GOM



Advanced integrated interpretation enabled TOC evaluation in challenging conditions, saving rig time and money.

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