

Cement Bond Quality Evaluated in 9⁵/₈-in Casing with Highly Attenuative Heavy Mud, Norway

PowerFlex annular barrier evaluation service extends ultrasonic measurement beyond conventional capabilities to fulfill the NORSOK D-010 standard

CHALLENGE

Evaluate cement bond quality behind 9⁵/₈-in casing in heavy oil-base mud.

SOLUTION

Deploy new PowerFlex annular barrier evaluation service that enables ultrasonic evaluation of well integrity in most mud weights and in large-diameter, thick casings.

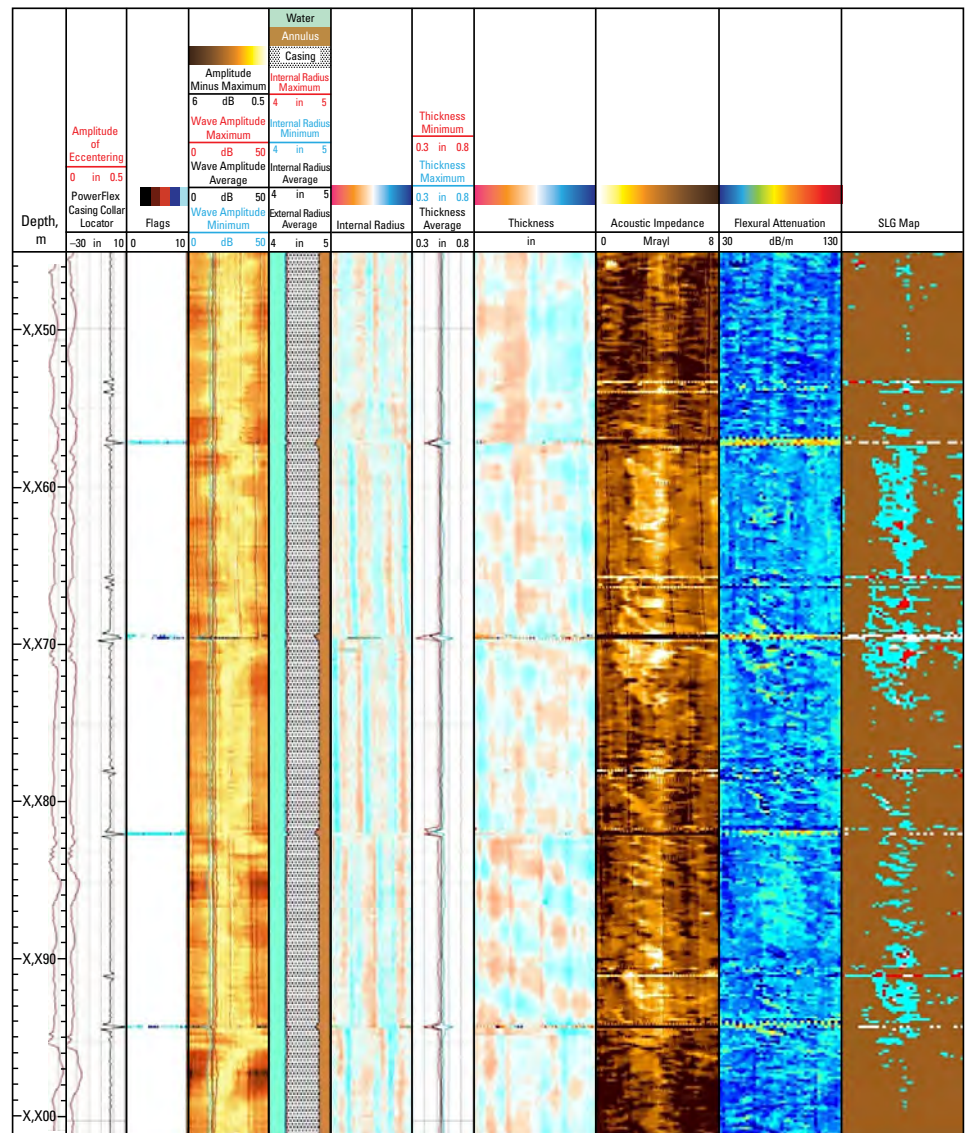
RESULTS

Obtained superior-quality data for the evaluation of cement bond quality that fulfilled the requirements of the NORSOK D-010 standard for well integrity in drilling and well operations.



Challenging cement evaluation in heavy oil-base mud

An operator offshore Norway needed to evaluate the cement bond quality for 9⁵/₈-in 53.5-lbm/ft casing containing heavy oil-base mud. Conventional ultrasonic logging services have difficulty properly processing the signal reflected back to the transducer in high mud weights because the signal is significantly attenuated. The alternative of swapping out the heavy mud with low-attenuation fluids before logging is expensive and time consuming, especially on deepwater rigs.



PowerFlex service provided a quantified annular evaluation in the heavy mud environment, where the cement weight was less than that of the mud.

Capability and efficiency for certainty in cement bond quality

New PowerFlex annular barrier evaluation service features an advanced mechanical design incorporating a powerful new transducer to resolve annular information in casing diameters up to 22 in and thicknesses of 1 in or more. Measurement capabilities are also extended by the service's extremely low sensitivity to the well fluid, including very heavy muds. The superior-quality data is available faster through optimized downhole and surface telemetry systems, and integrated workflows drive visualization and processing for an efficient 2-hour turnaround time from acquisition to wellsite answers. Further workflows powered by the Techlog* wellsite software platform are available for postprocessing.

Cement bond evaluation to the NORSOK D-010 standard despite attenuative environment

Despite the low-contrast acoustic conditions posed by the 1.6-g/cm³ density of the logging fluid and 1.54-g/cm³ cement density, PowerFlex service efficiently and thoroughly evaluated the cement bond quality in full azimuthal resolution, including a solid-liquid-gas (SLG) map. With these quantified answers, the operator was able to fulfill the requirements of the NORSOK D-010 standard.

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