CASE STUDY:
THROUGH TUBING CEMENT & HYDRAULIC ISOLATION EVALUATION

Problem Statement

Well was completed with 3-1/2" tubing single oil producer.
The well is currently shut in and plug was set in the production tubing.
For P&A preparation, cement evaluation is to be implemented across cap rock depth to evaluate the cement integrity and to evaluate the top of cement (TOC) behind the 7" production casing & 10-3/4" surface casing.

Findings

To achieve well objective, i-QUAD Cement Scanner (ICS) and Hydraulic Isolation Analysis was used to evaluate cement volume behind 7" casing and 10-3/4" casing.

Presence of cement are observed throughout the logging interval, thus no indication of the TOC for 7" & 10-3/4" casing. Overall, 10-3/4" casing shows moderate cement volume except for a few intervals while 7" casing, observed good volume of cement, below XXm. Above this depth, the cement volume started to reduce to a moderate amount.

Low-velocity gas travelling-up behind 7" casing, starting from below the MLD up to XXm (cement bridge inside the B-annulus). Higher pressure inside the void below the cement bridge is slowly released to a lower pressure void, above the bridge. This pressure expansion generated turbulence, which created a high amplitude noise and captured by the ILD. The cement bridge is also causing a slow pressure build-up at the B-annulus surface pressure, which was observed during the venting pass.

Benefit & Added Value

Slim tool design, Max OD 1.20"

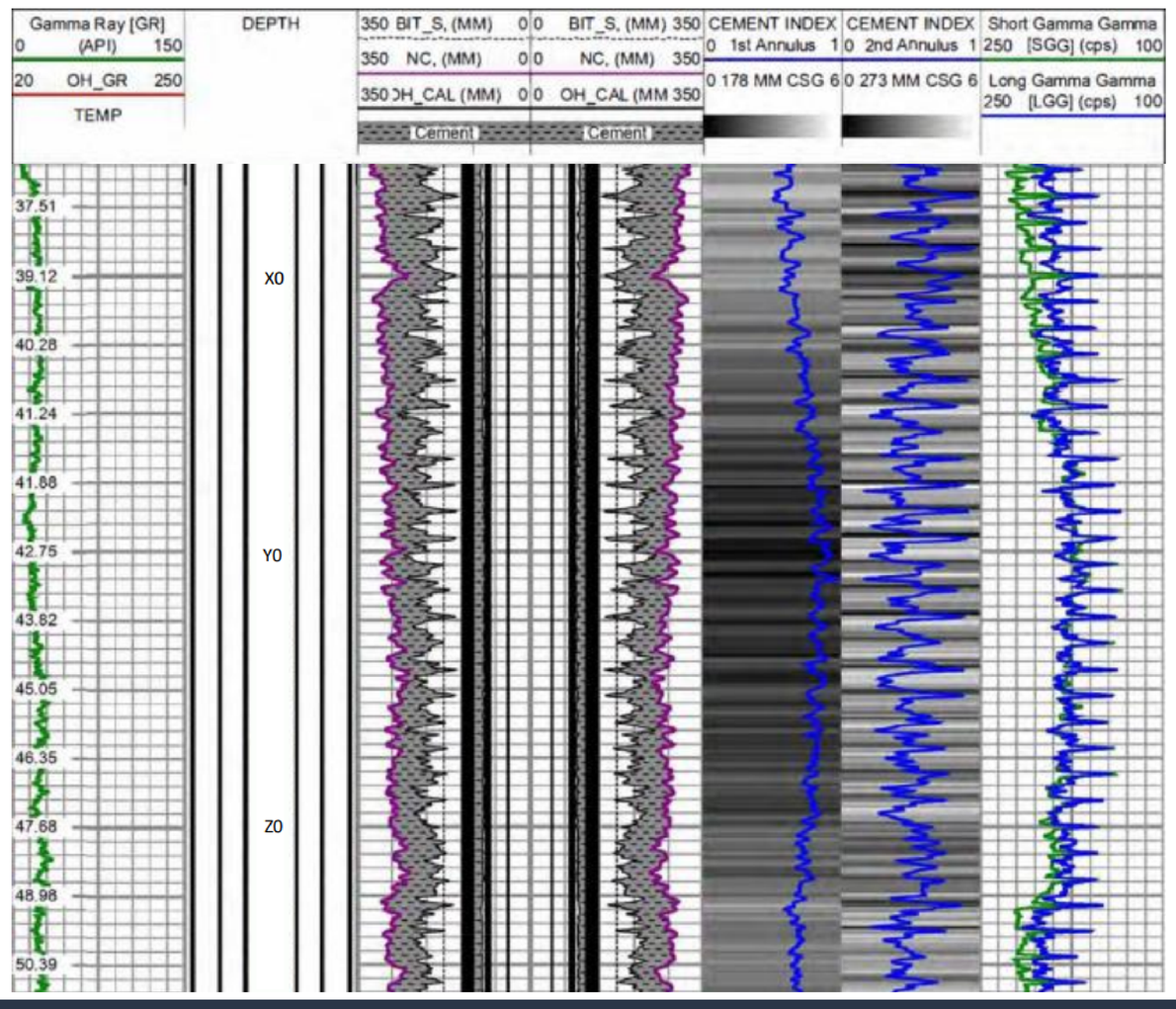
Cheaper mobilization & deployment.

Cement Scanner made cement evaluation behind first and second casing accessible while logging inside tubing via Slickline Deployment.

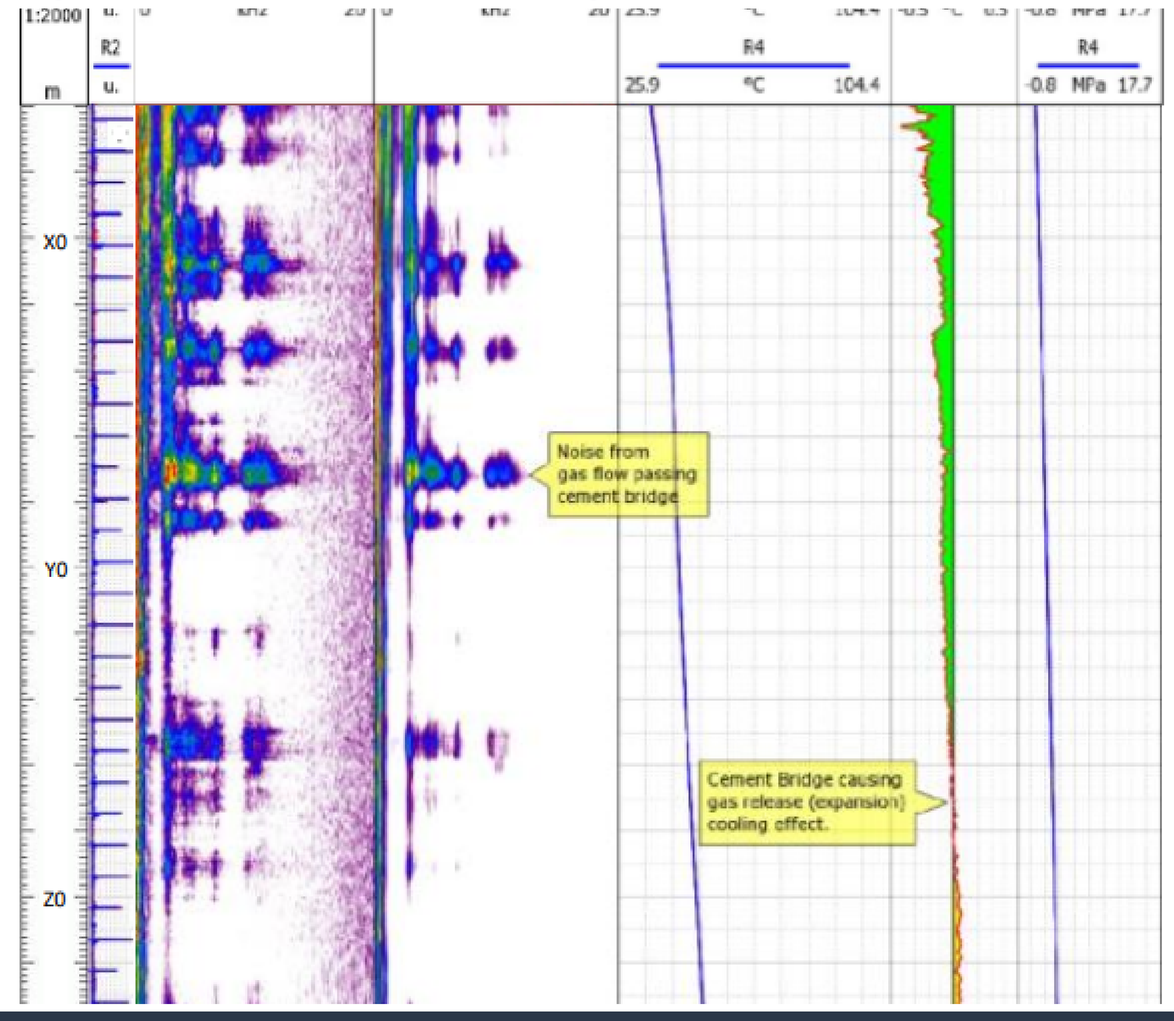
Added advantage with Hydraulic Isolation Analysis where active channeling and fluid migration is identified.

Combination of both technology is an added value to offline pre-P&A assessment.

i-QUAD Cement Scanner



Hydraulic Isolation Analysis



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