

ABSTRAK

EVALUASI OPERASIONAL REMEDIAL *SQUEEZE CEMENTING* GUNA PERBAIKAN *PRIMARY CEMENTING* PADA SUMUR “LOM-06” LAPANGAN “PTR”

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Penyemenan merupakan tahap kritis dalam operasi pemboran sumur minyak dan gas, berfungsi untuk mengisolasi zona, menstabilkan *casing*, dan menjaga integritas sumur. Kualitas penyemenan dinilai menggunakan *Cement bond log* (CBL) dan *Variable density log* (VDL), yang mengukur kekuatan ikatan semen-*casing* serta mendeteksi kebocoran. Pada Sumur LOM-06, analisis CBL/VDL menunjukkan indikasi *free pipe* pada interval 1127–1137 m, ditandai dengan amplitudo CBL rendah (36–48 mV) dan pola VDL yang didominasi sinyal *casing*. Kondisi ini mengindikasikan ikatan semen yang buruk, berpotensi menyebabkan kebocoran fluida dan mengganggu produksi, terutama di zona produktif 1130–1134 m.

Untuk memperbaiki masalah tersebut, dilakukan remedial *squeeze cementing* dengan metode *balance plug*, meliputi perhitungan volume semen, tekanan hidrostatik, dan tekanan maksimum pompa guna memastikan keamanan formasi. Hasil perhitungan menunjukkan kebutuhan 11,4 bbl cement *slurry* (36 sak semen) dengan spacer dan *displacement fluid* masing-masing 3,08 bbl, 0,57 bbl, dan 19,5 bbl dan ketinggian puncak kolom semen setinggi 1082 m. Tekanan *squeeze* yang diterapkan (1500 psi) berada di bawah tekanan rekah formasi (3207 psi), sehingga proses berlangsung aman tanpa merusak formasi.

Setelah semua proses penyemenan sudah selesai, dilakukan *pressure test casing* pada kedalaman 1032 m dengan tekanan 300 psi selama 5 menit, menunjukkan hasil yang baik. Uji *drill out* pada interval 1127–1137 m juga mengonfirmasi keberhasilan perbaikan ikatan semen tanpa perlu penyemenan ulang. Dengan demikian, pekerjaan remedial *squeeze cementing* berhasil memulihkan isolasi zona dan meningkatkan integritas sumur.

Kata kunci: Penyemenan Sumur, Log CBL-VDL, Remedial Squeeze cementing, Tekanan Squeeze

ABSTRACT

OPERATIONAL EVALUATION OF REMEDIAL SQUEEZE CEMENTING FOR IMPROVING PRIMARY CEMENTING IN WELL “LOM-06”, “PTR” FIELD

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Cementing serves as a critical phase in oil and gas well drilling operations, functioning to isolate zones, stabilize casing, and maintain well integrity. Cement bond quality is evaluated using Cement bond log (CBL) and Variable density log (VDL), which measure cement-to-casing bond strength and detect potential leaks. In Well LOM-06, CBL/VDL analysis indicated free pipe conditions across the 1127-1137 m interval, characterized by low CBL amplitude (36-48 mV) and VDL patterns dominated by casing signals. This condition suggested poor cement BONDING that could potentially lead to fluid migration and production interference, particularly in the productive zone at 1130-1134 m.

To address this issue, remedial squeeze cementing was performed using the balance plug method, involving calculations of cement volume, hydrostatic pressure, and maximum pump pressure to ensure formation safety. The calculations determined a requirement of 11,4 bbl of cement slurry (36 sacks) with 3.08 bbl spacer ahead, 0.57 bbl spacer behind, and 18.9 bbl displacement fluid and The height of the top of the cement column is 1082 meters.. The applied squeeze pressure (1500 psi) remained below the formation breakdown pressure (3207 psi), ensuring a safe operation without formation damage.

Following cementing operations, a casing pressure test was conducted at 1032 m depth with 300 psi pressure for 5 minutes, yielding positive results. Subsequent drill-out testing across the 1127-1137 m interval confirmed successful cement bond restoration without requiring re-cementing. The remedial squeeze cementing operation effectively restored zonal isolation and enhanced well integrity.

Keywords: Well Cementing, CBL-VDL Log, Remedial Squeeze cementing, Squeeze cementing