

RINGKASAN

EVALUASI HASIL *REMEDIAL CEMENTING* DAN REFORMULASI *SLURRY SEMEN* TERHADAP KEBERHASILAN *REMEDIAL CEMENTING* DENGAN PERMASALAHAN GAS CO₂ *CHANNELING* DI SUMUR D-04 LAPANGAN JATIBARANG

Oleh
Defi Rustami
NIM: 213221009
(Program Studi Magister Teknik Perminyakan)

Sumur D-04 merupakan sumur dengan reservoir minyak dan gas pada Struktur Bangodua Formasi Cibulakan Atas (CBA) yang berada di wilayah kerja PT. Pertamina EP Asset 3 Field Jatibarang. Sumur ini mulai berproduksi pada tahun 2013 dimana seiring berjalannya waktu Sumur D-04 mengalami penurunan produksi yang berdasarkan data salah satunya disebabkan karena sering terjadi kerusakan *artificial lift* ESP. Kerusakan *Electric Submersible Pump* terjadi karena terdapat gas yang ikut terproduksi akibat *problem bonding* semen yang kurang baik yang menyebabkan *channeling* di sekitar lubang sumur. *Remedial cementing* dilakukan untuk mengatasi *problem* tersebut pada zona yang terindikasi memiliki *bonding cement* yang buruk.

Penelitian diawali dengan melakukan pengumpulan data seperti data sumur, data reservoir, data *logging* dan program penyemenan. Analisa penyebab terjadinya air/gas CO₂ *channeling* dilakukan pada Sumur D-04 yaitu dengan menginterpretasi *Cemen Bond Log* (CBL) dan *Variable Density Log* (VDL). Hasil analisa digunakan untuk menentukan zona yang perlu dilakukan penyemenan ulang (perbaikan *bonding*) dan reformulasi untuk mengatasi problem air/gas CO₂ *channeling*. Evaluasi kinerja sumur dilakukan setelah perbaikan *bonding* yaitu dengan membandingkan kinerja produksi sebelum dan sesudah *remedial cementing*.

Analisa yang telah dilakukan memberikan hasil bahwa terdapat tiga zona pada Sumur D-04 yang perlu dilakukan *remedial cementing* yaitu pada interval 1040-1041 mMD, 1045-1048 mMD, dan 1055-1057 mMD. Penyemenan dibagi menjadi tiga tahap dimana pada tahap pertama keberhasilan *remedial cementing* tercapai setelah melakukan 4 kali reformulasi *cement slurry* dengan penggunaan *spherilite* sebagai semen *lite* untuk memperkuat *compressive strength*. Berdasarkan analisa CBL dan VDL serta kinerja sumur sebelum dan sesudah *remedial cementing* menunjukkan perbaikan *bonding* secara keseluruhan pada sumur D-04 berhasil menyekat zona gas dan zona air dan memberikan pengaruh positif terhadap kinerja produksi.

Key word : *remedial cementing, channeling, bonding, reformulasi*

ABSTRACT

EVALUATION OF REMEDIAL CEMENTING RESULTS AND CEMENT SLURRY REFORMULATION ON THE SUCCESS OF REMEDIAL CEMENTING WITH CO₂ CHANNELING GAS PROBLEM IN WELL D-04 JATIBARANG FIELD

By

Defi Rustami

NIM: 213221009

(Master of Petroleum Engineering Program)

Well D-04 is a well with oil and gas reservoirs in the Bangodua Structure of the Upper Cibulakan Formation (CBA) located in the PT Pertamina EP Asset 3 Field Jatibarang working area. This well began production in 2013 where over time Well D-04 experienced a decline in production, which based on data, one of which was caused by frequent damage to the artificial lift ESP. Damage to the Electric Submersible Pump occurred because there was gas that was produced due to poor cement bonding problems that caused channeling around the wellbore. Remedial cementing was carried out to overcome the problem in zones indicated to have poor cement bonding.

The study began with data collection such as well data, reservoir data, logging data and cementing program. Analysis of the cause of CO₂ water/gas channeling was conducted at Well D-04 by interpreting the Cemen Bond Log (CBL) and Variable Density Log (VDL). The results of the analysis were used to determine the zones that needed to be re-cemented (bonding repair) and reformulated to overcome the CO₂ channeling water/gas problem. Well performance evaluation was conducted after bonding repair by comparing production performance before and after remedial cementing.

The analysis that has been carried out provides results that there are three zones in Well D-04 that need remedial cementing, namely at intervals 1040-1041 mMD, 1045-1048 mMD, and 1055-1057 mMD. Cementing was divided into three stages where in the first stage the success of remedial cementing was achieved after reformulating the cement slurry 4 times with the use of spherilite as lite cement to strengthen compressive strength. Based on CBL and VDL analysis and well performance before and after remedial cementing, the overall bonding improvement in well D-04 successfully sealed the gas zone and water zone and had a positive influence on production performance.

Key word : *remedial cementing, channeling, bonding, reformulation*