

RINGKASAN

EVALUASI *CASING SETTING DEPTH* BERDASARKAN VALIDASI *KICK TOLERANCE* MENGGUNAKAN *DRILLER'S METHOD* PADA SUMUR “AB-09” LAPANGAN “EL”

Oleh
Maria Annabelle Hutajulu
NIM: 113210089
(Program Studi Sarjana Teknik Perminyakan)

Sumur “AB-09” merupakan sumur eksplorasi yang terletak di Cekungan Jawa Timur Utara yang menghadapi banyak permasalahan selama pengeboran berupa tingginya frekuensi *kick*, khususnya saat memasuki zona gas, serta kejadian loss circulation pada beberapa kedalaman. Permasalahan tersebut menyebabkan peningkatan waktu pengeboran hingga 122 hari, jauh dari target awal pengeboran yaitu 64 hari, serta meningkatkan risiko keselamatan operasi. Oleh karena itu, diperlukan evaluasi terhadap penentuan *casing setting depth* dan berat lumpur dengan validasi *kick tolerance* untuk memastikan ketahanan desain *casing* serta efektivitas berat lumpur dalam mengendalikan tekanan formasi.

Penelitian menggunakan pendekatan kuantitatif dengan analisis numerik berbasis studi kasus, yang dimulai dari pengumpulan data, penentuan *casing setting depth* dan berat lumpur serta korelasi dengan data *pore pressure-fracture gradient* (PPFG) dan litologi, perhitungan panjang dan volume *influx* pada mata bor serta *casing shoe*, penentuan *kick tolerance*, serta mengevaluasi *casing setting depth* dan berat lumpur.

Hasil penelitian menunjukkan bahwa diperlukan perubahan pada kedalaman *casing* 9-5/8” menjadi 5512 ftTVD dan berat lumpur pada trayek 12-1/4” menjadi 9,92 ppg serta trayek 8-1/2” menjadi 13,77 ppg. Melalui analisis hasil *kick tolerance*, berat lumpur, dan kedalaman *casing* terdangkal, evaluasi ini menunjukkan pentingnya validasi *kick tolerance* pada Sumur “AB-09” dalam perencanaan *casing setting depth* untuk meningkatkan keamanan operasi dan efisiensi biaya pengeboran dengan meminimalkan potensi *kick* dan tetap memenuhi standar *kick tolerance*.

Kata kunci: *casing setting depth*, *Driller's method*, *kick*, *kick tolerance*, *well control*

ABSTRACT

CASING SETTING DEPTH EVALUATION BASED ON KICK TOLERANCE VALIDATION USING DRILLER'S METHOD ON WELL "AB-09" "EL" FIELD

By

Maria Annabelle Hutajulu

NIM: 113210089

(Petroleum Engineering Undergraduate Program)

Well "AB-09" is an exploration well located in the North East Java Basin, which encountered numerous challenges during drilling, including a high frequency of kicks, particularly when entering the gas zone, and several occurrences of loss circulation at various depths. These issues led to an increase in drilling time to 122 days, far beyond the initial target of 64 days, and also raised safety risks during operations. Therefore, an evaluation of the casing setting depth and mud weight with kick tolerance validation is required to ensure the integrity of the casing design and the effectiveness of the mud weight in controlling formation pressure.

The study employs a quantitative approach with numerical analysis based on a case study, beginning with data collection, determination of casing setting depth and mud weight along with correlation to pore pressure–fracture gradient (PPFG) and lithology data, calculation of influx length and volume at the bit and casing shoe, determination of kick tolerance, as well as evaluation of casing setting depth and mud weight.

The results indicate the need to revise the 9-5/8" casing depth to 5512 ftTVD, with mud weights adjusted to 9.92 ppg for the 12-1/4" section and 13.77 ppg for the 8-1/2" section. Through the analysis of kick tolerance, mud weight, and shallowest casing depth, this evaluation highlights the importance of kick tolerance validation in casing setting depth planning for Well "AB-09" to enhance operational safety and drilling cost efficiency by minimizing kick potential while still meeting kick tolerance standards.

Keywords: casing setting depth, Driller's method, kick, kick tolerance, well control