

ABSTRAK

PERANCANGAN PENGEBORAN SUMUR BERARAH “A-10” PADA LAPANGAN “P”

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Sumur "A-10" di Lapangan "P" direncanakan sebagai sumur sisipan (*infill well*) dengan pemboran berarah tipe *S-Shape* guna memproduksi sisa cadangan minyak di reservoir Kelompok Sihapas dan Pematang. Teknik ini diaplikasikan untuk menyiasati target reservoir yang tidak dapat dicapai melalui pengeboran vertikal. Oleh karena itu, perancangan teknis sangat penting dilakukan agar lintasan sumur bisa mencapai target secara akurat, aman, dan tetap efisien secara operasional.

Penelitian ini menggunakan perhitungan analitik manual untuk seluruh aspek teknis, mencakup perancangan lintasan (*Minimum Curvature*), program lumpur dan penyemenan, perancangan BHA, evaluasi *rig*, hingga integritas *casing* (*burst*, *collapse*, *tension*, dan *biaxial*). Hasil perhitungan manual tersebut kemudian divalidasi dan divisualisasikan menggunakan perangkat lunak industri: COMPASS untuk visualisasi lintasan, Stresscheck untuk grafik keamanan *casing* dan WellPlan untuk profil hidrolika dan *torque & drag*.

Hasil perancangan menetapkan Sumur "A-10" berprofil *S-Shape* mencapai kedalaman akhir 6.763 ft MD (6.659 ft TVD), inklinasi maksimum 20°, dan azimuth N67,47°E. Berdasarkan geometri tersebut, diperoleh nilai *Directional Difficulty Index* (DDI) sebesar 4,654 yang masuk dalam kategori kesulitan sedang (*medium*). Perancangan *casing* menggunakan *conductor* 24" (80 ft), *surface* 9-5/8" K-55 36 ppf (2.390 ft MD), dan *production* 7" K-55 26 ppf hingga dasar sumur. Operasi menggunakan lumpur KCL-Polymer 7% dengan densitas 9,0–9,4 ppg (*surface*) dan 9,5–10,0 ppg (*production*). Total volume semen diestimasi 266,43 bbl (*surface*) dan 270,29 bbl (*production*). Hasil perancangan dari seluruh operasi ini disimpulkan aman untuk dieksekusi menggunakan *Rig* PDSI #54.2/ZJ750-M berkapasitas *drawwork* 750 HP.

Kata kunci: Perancangan *Casing*, Perancangan Lintasan, Pemboran Berarah, Pemilihan *Rig*, Sumur *Infill*

ABSTRACT

DIRECTIONAL DRILLING WELL DESIGN “A-10” WELL ON “P” FIELD

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Well "A-10" in Field "P" is planned as an infill well utilizing an S-Shape directional drilling technique to produce the remaining oil reserves in the Sihapas and Pematang Group reservoirs. This technique is applied to reach reservoir targets that are inaccessible via vertical drilling. Therefore, comprehensive technical planning is crucial to ensure the well trajectory reaches the target accurately, safely, and with operational efficiency.

This study employs manual analytical calculations for all technical aspects, encompassing trajectory determination (Minimum Curvature), mud and cementing programs, BHA design, rig evaluation, and casing integrity (burst, collapse, tension, and biaxial). The manual calculation results are subsequently validated and visualized using industry-standard software: COMPASS for trajectory visualization, Stresscheck for casing integrity plots, and WellPlan for hydraulics and torque & drag profiles.

The planning results establish that Well "A-10" has an S-Shape profile reaching a final Depth of 6,763 ft MD (6,659 ft TVD), with a Maximum Inclination of 20° and an azimuth of N67.47°E. Based on this geometry, a Directional Difficulty Index (DDI) value of 4.654 is obtained, which falls into the medium difficulty category. The casing design utilizes a 24" conductor (80 ft), a 9-5/8" K-55 36 ppf surface casing (2,390 ft MD), and a 7" K-55 26 ppf production casing to the total Depth. The operation uses a 7% KCL-Polymer mud with a Density of 9.0–9.4 ppg (surface section) and 9.5–10.0 ppg (production section). The total cement volume is estimated at 266.43 bbl (surface) and 270.29 bbl (production). All of these operations are concluded to be safe for execution using the PDSI #54.2/ZJ750-M Rig with a 750 HP drawworks capacity.

Keywords: *Casing Design, Directional drilling, Infill Well, Rig Selection, Trajectory Design*