

## RINGKASAN

Pada pemboran Sumur R-010 yang terletak di Lapangan OFN, Cekungan Jawa Timur Utara, ditemukan beberapa *problem* pemboran. Pada saat operasi pemboran dengan interval kedalaman 610 - 645 m dan 676 - 700 m terjadi *problem sloughing*. Selain itu, terdapat beberapa permasalahan *hole collapse* pada interval kedalaman 739 - 754 m, 865 - 882 m, dan 935 - 944 m.

Digunakan metode penelitian yang meliputi beberapa tahapan, yaitu studi literatur, pengumpulan data, pengolahan dan analisis data. Data *Well log* (*gamma ray log*, *density log*, dan *sonic log*) digunakan untuk menentukan parameter dasar seperti *shale base line*, *overburden pressure*, *normal compaction trend* (NCT) serta untuk menentukan jenis *overpressure mechanism* yang terjadi. Data *drilling report* berupa densitas lumpur digunakan sebagai validasi prediksi *pore pressure* dan *pressure data leak-off test* menjadi acuan validasi prediksi *fracture gradient*. Pengolahan dan analisis data dilakukan untuk mendapatkan parameter mekanika batuan, seperti *poisson ratio*, *internal frictional angle* dan *cohesive strength*. Dalam pengolahan dan analisis data tersebut didapatkan beberapa parameter yang mendukung model geomekanik 1D, yaitu *minimum horizontal stress*, *maximum horizontal stress*, dan *shear failure gradient*.

Hasil analisis geomekanik 1D menunjukkan bahwa *sloughing* pada interval kedalaman 610 - 645 m dan 676 - 700 m karena nilai *mud weight* yang digunakan lebih rendah dari nilai *shear failure gradient*. Untuk penanggulangan *problem* pemboran tersebut, maka nilai *mud weight* harus dinaikkan dari 8.75 - 9.00 ppg menjadi 9.00 - 11.00 ppg. Pada interval kedalaman 701 - 1072 m digunakan nilai *mud weight* dari 8.75 - 8.83 ppg menjadi 8.60 - 10.60 ppg untuk menangani *problem hole collapse*. Perencanaan *mud weight* yang aman untuk digunakan harus lebih besar dari *pore pressure* dan *shear failure gradient*, tetapi tidak lebih besar dari *minimum horizontal stress* dan *fracture gradient*.

**Kata kunci:** *Wellbore Stability*, Geomekanik 1D, *Safe Mud Window*, *Mud Weight*.

## ABSTRACT

*During the drilling of Well R-010, located in the OFN Field, North East Java Basin, encountered several drilling problems. During drilling operations at depth intervals of 610–645 m and 676–700 m, sloughing problems occurred. In addition, several hole collapse problems were encountered at depth intervals of 739–754 m, 865–882 m, and 935–944 m.*

*The research methodology consisted of several stages, including literature study, data collection, data processing, and data analysis. Well log data (gamma ray log, density log, and sonic log) were used to determine basic parameters such as shale baseline, overburden pressure, normal compaction trend (NCT), and to identify the type of overpressure mechanism occurring. Drilling report data, specifically mud density, were used to validate pore pressure predictions, and leak-off test pressure data served as a reference for validating fracture gradient predictions. Data processing and analysis were conducted to obtain rock mechanics parameters, including Poisson's ratio, internal friction angle, and cohesive strength. From this processing and analysis, several supporting parameters for the 1D geomechanical model were derived, namely minimum horizontal stress, maximum horizontal stress, and shear failure gradient.*

*The results of the 1D geomechanical analysis indicate that sloughing at depth intervals of 610–645 m and 676–700 m occurred because the mud weight used was lower than the shear failure gradient. To mitigate this drilling problem, the mud weight must be increased from 8.75–9.00 ppg to 9.00–11.00 ppg. At the depth interval of 701–1072 m, the mud weight must be increased from 8.75–8.83 ppg to 8.60–10.60 ppg to address the hole collapse problem. A safe mud weight plan must be greater than the pore pressure and shear failure gradient, but not exceed the minimum horizontal stress and fracture gradient.*

**Keywords:** *Wellbore Stability, 1D geomechanical, Safe Mud Window, Mud Weight*