

ABSTRAK

Lapangan Kalidam merupakan salah satu lapangan produksi migas di Cekungan Kutai, Kalimantan Timur. Lapangan ini memiliki zona *overpressure* yang berbahaya pada proses mekanisme pengeboran yang tersebar pada sumur-sumur produksi, terutama ditereng barat Samarinda *Anticlinorium*.

Estimasi tekanan pori kombinasi data sumur dengan kecepatan seismik diperlukan untuk menentukan distribusi tekanan pori pada sumur penelitian Lapangan Kalidam, zona *overpressure* dan perencanaan mitigasi seperti menentukan berat lumpur pengeboran dan lokasi kedalaman *casing* yang tepat sebagai tindakan keselamatan pengeboran. Pendekatan yang digunakan untuk memprediksi tekanan pori adalah metoda Eaton (1997) dan Bower (1999) dengan kalibrasi data tes tekanan pori (RFT) dan pantulan vitrinit (Ro) Lapangan Kalidam.

Pemodelan Eaton memiliki nilai estimasi terbaik dan efektif dibandingkan dengan model Bower *Loading* dan *Unloading*. Berdasarkan peta distribusi tekanan pori zona transisi interval (I2-I21) pada Lapangan Kalidam sayap barat dan timur memiliki beda tekanan sekitar 800-1.050 psi lebih rendah dibandingkan diarea tertinggi yang mencapai beda tekanan sekitar 1.050-1.500 psi. Dari interpretasi sumur TDP-222 diarea tertinggi memiliki ketebalan zona transisi lebih tipis kisaran 178,3 ft dibandingkan disayap barat dan timur berdasarkan sumur TDP-149 dengan kisaran 509 ft. *Top overpressure* paling dangkal Lapangan Kalidam berada disayap timur berdasarkan sumur TDP-32 dengan kisaran kedalaman 12.911,04 ft dan yang paling dalam berada disayap barat berdasarkan sumur TDP-149 dengan kisaran kedalaman 14.440,5 ft. Mekanisme *loading* seperti struktur tektonik dan *disequilibrium compaction* dengan mekanisme *unloading* seperti generalisasi hidrokarbon dan diagenesis mineral lempung diyakini sebagai mekanisme yang bekerja pada Lapangan Kalidam, Cekungan Kutai, Kalimantan Timur berdasarkan analisis data penelitian, data informasi geologi dan *internal report*. Mitigasi zona *overpressure* diprioritaskan pada kedalaman 12.000 ft sampai 13.000 ft berupa rekomendasi penentuan berat lumpur pengeboran dari 15,8 ppg sampai 18,2 ppg secara bertahap dan penentuan kedalaman *casing point* yang aman pada interval G-I2-I21 untuk sumur eksplorasi baru.

Kata kunci : *overpressure*, tekanan pori, mekanisme *loading*, mekanisme *unloading*.

ABSTRACT

Kalidam field is one of the oil and gas production fields in the Kutai Basin, East Kalimantan. This field has a dangerous overpressure zone in the process of drilling mechanisms that spread the production wells, especially the western slope of Samarinda anticlinorium.

Estimation of pore pressure well data combined with seismic velocity needed to determine the distribution of pore pressure in the wells research Kalidam Fields, overpressure zone and mitigation plan such as determine the drilling mud weight and location of appropriate depth of casing as a drilling safety precaution. The approach used to predict pore pressure is the method of Eaton (1997) and Bower (1999) with the calibration data is pore pressure test (RFT) and vitrinite reflectance (Ro) Kalidam Field.

Eaton model has a best estimate value and effective compared with the Bower Loading and Unloading models. Based on the map of the distribution of pore pressure transition zone interval (I2-I21) in east and west flank Kalidam Fields has a different pressure of about 800-1050 psi lower than highs area reaching around 1050-1500 psi pressure differential. From well TDP-222 interpretation of transition zone thickness in height areas about 178.3 ft is tinner than west and east flank based on well TDP-149 about 509 ft. The shallowest of top overpressure in Kalidam field is in east flank based on well TDP-32 about 12,911.04 ft whereas the deepest is in west flank based on well TDP-149 about 14,440.5 ft. Loading mechanism such as tectonic structures and disequilibrium compaction with unloading mechanisms such as generalization hydrocarbon and clay mineral diagenesis is convinced to be a mechanism that works in Kalidam field, Kutai Basin, East Kalimantan based on research data analysis, geological information data and internal report. Mitigations of overpressure zone prioritized in depth 12,000 ft until 13,000 ft with recommendation drilling mud weight range gradually 15.8 ppg until 18.2 ppg and safety determination of depth casing point at interval G-I2-I2 for new exploration wells.

Keywords: overpressure, pore pressure, loading mechanisms, unloading mechanisms.