

PERBANDINGAN KECEPATAN SONIC DAN KECEPATAN INTERVAL DALAM PREDIKSI 3D TEKATAN PORI MENGGUNAKAN METODE EATON PADA LAPANGAN "AZK", SUB CEKUNGAN PALEMBANG SELATAN, CEKUNGAN SUMATERA SELATAN

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Industri migas terus menghadapi banyak tantangan dalam proses eksplorasi, salah satunya kejadian sejarah ledakan pada anjungan pengeboran minyak *Deep Water Horizon* di Teluk Meksiko yang disebabkan adanya kegagalan *well-control* dan kesalahan pengeboran sehingga terjadi *blowout*. Salah satu penyebab terjadinya kesalahan pengeboran adalah *overpressure* yang terjadi ketika tekanan fluida pada pori batuan lebih besar dari tekanan normal. Pada penelitian ini dilakukan perhitungan tekanan pori dan penentuan zona *overpressure* di Lapangan "AZK", Sub-cekungan Palembang Selatan, Cekungan Sumatera Selatan dengan membandingkan dua nilai kecepatan yaitu kecepatan sonic dan kecepatan interval. Hasil tekanan pori selanjutnya dimodelkan melalui pemodelan 1D dan pemodelan 3D, dilakukan juga inversi impedansi akustik dengan metode inversi model based. Metode yang digunakan pada penelitian ini adalah Metode Eaton dengan fokus zona penelitan pada Formasi Baturaja hingga Formasi Talang Akar. Zona *overpressure* ditemukan pada bagian bawah Formasi Talang Akar di kedalaman 2200 – 2500 m dengan nilai tekanan pori berdasarkan kecepatan sonic sebesar 3952.4 – 5007.5 Psi dan berdasarkan kecepatan interval sebesar 4038 – 5920.1 Psi. Mekanisme penyebab *overpressure* di bagian bawah talang akar tergolong dalam mekanisme *loading* dan *mekanisme unloading*. Mekanisme *loading* terjadi akibat ketidakseimbangan kompaksi batuan (*disequilibrium compaction*) sedangkan mekanisme *unloading* disebabkan adanya perubahan mineral lempung (smektit menjadi illit. Kedua mekanisme ini menyebabkan fenomena perpindahan *overpressure* (*Lateral Reservoir Drainage*). Perbandingan data kecepatan menghasilkan penggunaan kecepatan interval dianggap lebih efisien dan murah daripada penggunaan kecepatan sonic baik dalam proses pemodelan, perhitungan, maupun analisis zona *overpressure*.

Kata kunci : Tekanan pori, *Overpressure*, Kecepatan sonic, Kecepatan interval.

ABSTRACT

COMPARISON OF SONIC VELOCITY AND INTERVAL VELOCITY 3D PREDICTION OF PORE PRESSURE USING THE EATON METHOD IN THE "AZK" FIELD, SOUTH PALEMBANG BASIN, SOUTH SUMATERA BASIN

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The oil and gas industry continues to face many challenges in the exploration process, one of which is the historical explosion on the Deep Water Horizon oil drilling platform in the Gulf of Mexico which was caused by well-control failures and drilling errors resulting in a blowout. One of the causes of drilling errors is overpressure which occurs when the fluid pressure in the rock pores is greater than normal pressure. In this research, pore pressure calculations and overpressure zone determination were carried out in the "AZK" Field, South Palembang Sub-basin, South Sumatra Basin by comparing two velocity values, namely sonic velocity and interval velocity. The pore pressure results were then modeled through 1D modeling and 3D modeling, and acoustic impedance inversion was also carried out using a model based inversion method. The method used in this research is the Eaton Method with a research zone focus on the Baturaja Formation to the Talang Akar Formation. The overpressure zone was found at the bottom of the Talang Akar Formation at a depth of 2200 – 2500 m with a pore pressure value based on sonic velocity of 3952.4 – 5007.5 Psi and based on interval velocity of 4038 – 5920.1 Psi. The mechanisms that cause overpressure at the bottom of the root gutter are classified as loading mechanisms and unloading mechanisms. The loading mechanism occurs due to an imbalance in rock compaction (disequilibrium compaction) while the unloading mechanism is caused by a change in clay minerals (smectite to illite. Both of these mechanisms cause the phenomenon of overpressure displacement (Lateral Reservoir Drainage). Comparison of velocity data results in the use of interval velocity being considered more effective and cheaper than the use of sonic velocity in the modeling process, calculations and analysis of overpressure zones.

Keywords : Pore pressure, Overpressure, Sonic velocity, Interval velocity