

ABSTRAK

Studi Desain Survei Seismik 3D Model Based dan Statik serta Perbandingan Layout Survei Ocean Bottom Node : Orthogonal Rolling, Parallel Dense dan Orthogonal Dense

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Lapangan “SEKAR” memiliki target survei berupa perangkap migas *thrust sheet anticline* dan struktur. Karena kondisi *reservoir* yang kompleks dan dominasi *thrust sheet anticline*, penentuan parameter akuisisi dilakukan berdasarkan model target survei. 3D *raymodel* tersusun dari enam *Horizon iso surface* yaitu *Horizon Formasi L*, *Horizon Formasi K*, *Horizon antiklin Formasi M* yang terlipat, *Horizon antiklin Formasi T* yang terlipat, *Horizon bottom Formasi M* dan *Horizon bottom* dari Formasi T. Enam *horizon* tersebut dilakukan analisis *raytracing* dan ditentukan parameter akuisisi utama. Parameter tersebut adalah ukuran *bin (spatial sampling)*, *maximum unaliased frequency*, *maximum usable offset* dan luas *migration aperture*.

Lapangan “Sekar” merupakan daerah transisi yang memiliki banyak terumbu karang sehingga survei seismik hanya dapat dilakukan menggunakan OBN (*ocean bottom nodes*). Salah satu tujuan penelitian ini membandingkan geometri survei *rolling pattern with orthogonal shot*, *parallel dense shot carpet geometry* dan *orthogonal dense shot carpet geometry*. Simulasi perekaman pada ketiga geometri dilakukan untuk melihat persebaran *fold*, *offset* dan *azimuth* serta analisa iluminasi *fold*. Selain perbandingan resolusi penelitian ini membandingkan aspek operasional dilapangan dan ekonomi. Hasil simulasi geometri survei *rolling pattern with orthogonal shot* memiliki persebaran *fold*, *offset* dan *azimuth* paling baik diantara ketiga layout. Geometri *parallel dense shot carpet* memiliki operasional dilapangan paling mudah, hanya dengan 17 kali *rolling template* untuk keseluruhan area survei. *Rolling pattern with orthogonal shot* membutuhkan biaya survei tertinggi karena menggunakan *nodes* paling banyak.

Kata Kunci : *thrust sheet anticline*, 3D *raymodel*, *raytracing*, OBN (*ocean bottom nodes*).

ABSTRACT

3D Model Based Acquisition Design and Comparison Ocean Bottom Node Layout: Orthogonal Rolling, Parallel Dense dan Orthogonal Dense

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Hydrocarbon trap of "SEKAR" Field is thrust sheet anticline and structure. Due to the complex-reservoir and thrust sheets domination, a target model orientated acquisition design is necessary. 3D raymodel composed of six Horizon iso surface. These Horizon are Horizon L Formation, Horizon K Formation, Horizon folded anticline M Formation, Horizon folded anticline T Formation, Horizon bottom M Formation and Horizon bottom T Formation. Sixth horizon are ray tracing analyzed and determined main acquisition parameters. These parameter are bin size (spatial sampling), maximum unaliased frequency, maximum usable offset and wide of migration aperture.

"SEKAR" Field located in the transition zone that has many coral reefs so seismic surveys can only done using the OBN (ocean bottom nodes). One objective of this study is to compares three geometry survey: rolling pattern with orthogonal shot, parallel dense shot carpet geometry and orthogonal dense shot carpet geometry. Recording simulation on these geometry had been done to see the fold distribution, azimuth distribution, offsets distribution and illumination fold analysis. This study also comparing operational and economic aspects. The results show that rolling pattern with orthogonal shot geometry has the best fold, azimuth, and offsets distribution. Parallel dense shot carpet geometry has the easiest field operations, with just 17 times rolling templates for the entire survey area. Rolling pattern with orthogonal shot has the highest survey-cost since it uses a lot of nodes.

Key Words : *thrust sheet anticline, 3D raymodel, raytracing, OBN (ocean bottom nodes).*

