Optimisasi produksi lapangan gas bumi menggunakan pendekatan biaya marginal = Production of natural gas field using marginal cost analysis approach

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Abstrak

[ABSTRAK
Pengembangan sebuah lapangan gas bumi memerlukan perencanaan akurat dalam rangka menentukan laju produksi gas yang merupakan salah satu tantangan utama dalam menentukan kelayakan proyek gas. Laju produksi gas optimum ditentukan tidak hanya oleh karakteristik cadangan gas dan reservoirnya, tetapi juga oleh persyaratan konsumen terkait tekanan gas jual, jangka waktu kontrak penjualan gas dan harga gas. Penelitian ini mengembangkan model optimisasi produksi gas yang didasarkan pada pendekatan biaya marjinal untuk memaksimumkan keuntungan ekonomi dengan menggunakan studi kasus lapangan gas bumi Blok Matindok di Sulawesi Tengah. Hasil penelitian mengungkapkan bahwa meningkatkan tekanan gas jual dan harga gas meningkatkan laju produksi gas optimum dan meningkatkan keuntungan maksimumnya. Sementara itu, peningkatan jangka waktu kontrak penjualan gas akan mengurangi tingkat produksi gas optimum dan mengurangi atau menaikkan keuntungan maksimumnya tergantung atas cadangan gas dan karakteristik reservoirnya. Karena keterbatasan cadangan dan karakteristik reservoir gas, maka peningkatan harga gas membatasi laju produksi optimumnya hingga batas laju maksimum reservoirnya, namun keuntungan maksimumnya akan naik terus mengikuti kenaikan harga gas. Hasil riset ini dengan jelas menunjukkan hubungan yang kuat antara persyaratan kebutuhan konsumen gas dan laju produksi gas optimum, yang merupakan bagian penting untuk negosiasi harga gas dan perencanaan produksi.
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ABSTRAK
The development of a gas field requires accurate planning, in order to determine the gas production rate which is one of the main challenges in determining the gas project feasibility. An optimum gas production rate is determined not only by the gas reserve and reservoir characteristics but also by the consumer’s requirements of the sales gas pressure, duration of the gas sales contract and gas price. This paper presents a gas production optimization model using marginal cost approach to maximize economic profit with Matindok Block as field data. The results reveal that increasing the sales gas pressure and gas price raises the optimum gas production rate and maximum profit. Meanwhile, increasing the duration of a gas sales contract will reduce the optimum gas production rate and reduce or increase the maximum profit depending on the gas reserve and reservoir characteristics. Due to limitation of gas reserves and reservoir characteristics, then an increase in gas prices limit the optimum production rate up to reservoir maximum rate limits, but the maximum profit will continue to follow up the gas price hike. This work clearly shows the relationship between the user’s requirements and optimum gas production rate, which is an important piece of information for negotiating the gas price and planning production, The development of a gas field requires accurate planning, in order to determine the gas production rate which is one of the main challenges in determining the gas project feasibility. An optimum gas production rate is determined not only by the gas reserve and reservoir characteristics but also by the consumer’s requirements of the sales gas pressure,

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