Optimasi produksi sumur gas dan penentuan kondisi prose untuk mendapatkan keuntungan yang maksimal

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Abstrak

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Pada suatu lokasi eksploitasi migas yang memiliki kapasitas sumur lebih besar daripada fasilitas pemrosesan ataupun permintaan gas dari pembeli, diperlukan optimasi sumur guna memaksimalkan keuntungan ekonomi dengan mempertimbangkan kandungan dari setiap sumur seperti minyak, Gas Methana & Ethana, Propana, Butana serta Pentana plus pada batasan fasilitas yang ada.

Pada penelitian ini dilakukan optimasi dari laju alir produk pada sumur gas. Optimasi menggunakan metode program linier dengan penyelesaian menggunakan Software Microsoft Excel Solver. Dari hasil tersebut kemudian didapatkan kombinasi laju alir gas serta komposisi gas umpan campuran yang akan menuju fasilitas fraksinasi gas. Gas tersebut akan digunakan untuk simulasi yang menggunakan software Hysys untuk menentukan kondisi proses di fasilitas fraksinasi gas guna memaksimalkan pengambilan produk LPG dan Kondensat dan juga dapat memenuhi spesifikasi produk penjualan.

Dari 32 sumur yang dilakukan optimasi didapatkan sumur X15, X16, X24, X27, X28, X30 ditutup, sumur X2 dibuka 29% sedangkan sumur lainya dibuka 100%. Total keuntungan yang didapatkan sebesar 3,198,961 USD. Sedangkan kondisi proses pada simulasi Hysys yang didapatkan yaitu temperatur reboiler pada kolom deethanizer, depropanizer serta debutanizer masing-masing 162 °, 231 °, 257 °F. Rasio Refluks pada kolom depropanizer dan debutanizer masing-masing 1.8 & 1.4. Sedangkan pada tangki stabilisasi kondensat diperoleh tekanan dan temperatur produk masing-masing 26.7 psia dan 80 °F.
<hr><i>ABSTRACT
In the gas exploitation area which the wells capacity is higher then the variable of facility capacity or buyer gas demand, is needed to optimize wells opening for maximizing the revenue by considering well contents such as oil, methana, ethana, propane, butane and pentane plus at the existing facility constraints.

This research is proposed to optimize gas wells opening. The optimization methode used in this research is the linier programming run by Software Microsoft Excel adds in Solver. The result is the solution of optimized gas flow variable for every well. Gas composition also can be found by blending all wells. This gas property is used for Hysys simulation to get the process condition at the LPG & Condensate fractionation unit in order to get the maximum recovery variable and to meet product selling specification.

From optimization of 32 wells, it is found that well X15, X16, X24 ,X27, X28, X30 are closed, well X2 are opened at 29% and other wells are fully opened. The total revenue obtained is 3,198,961 USD. From Hysys simulation, it is found that temperatures reboiler at column of deethanizer, depropanizer and debutanizer are 162° , 231 °, 257 °F. Reflux ratios at the column of depropanizer and debutanizer are 1.8 & 1.4. It is also

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