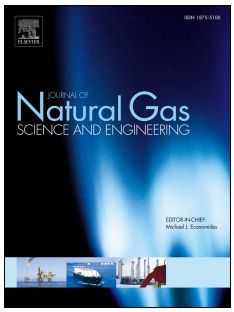
Accepted Manuscript



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PII: S1875-5100(17)30330-X

DOI: 10.1016/j.jngse.2017.08.018

Reference: JNGSE 2285

To appear in: *Journal of Natural Gas Science and Engineering*

Received Date: 4 December 2016

Revised Date: 23 July 2017

Accepted Date: 14 August 2017

Please cite this article as: Gohari Bahabadi, M., Ahmadi, M., Bazzi, A., Decision making for choosing the optimum production scenario for a sector model of South Pars gas field based on single well model, *Journal of Natural Gas Science & Engineering* (2017), doi: 10.1016/j.jngse.2017.08.018.

Decision making for choosing the optimum production scenario for a sector model of South Pars gas field based on single well model

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Abstract

Optimum production from a hydrocarbon field takes place when technical parameters are optimized with respect to the operational and economic constraints. Well control parameters have an important role in making decisions for choosing efficient production scenario in a reservoir. Among the economical constraints cost of drilling and completion of wells, transportation and refinery costs and price of oil and gas can be named. In this paper, using single well model, the design of experiments and multi criteria decision making, determination of optimum production scenario based on a sector of South Pars gas field is addressed. Flow rate, well spacing, minimum wellhead pressure, production string size, deviation of wells and type of stimulation are decision parameters that are considered in this study. Economic indices chosen for economic analysis are net present value, internal rate of return and plateau time. First using the design of experiments and response surface methodology, proxy models are generated to predict economic indices for production scenarios and after validation of them, they are used for economic analysis and choosing the best scenario based on multi-criteria decision making.

Keywords:

Well control parameters, Single well model, Design of experiments, Proxy model, Multi-criteria decision making.

1- Introduction

Successful development and management of a hydrocarbon reservoir rely mainly on choosing the best production strategy by taking physical, operating and economic limitations into account. Large number of variables to be optimized makes the definition of optimum production scenarios a difficult process, especially under a broad range of complicated reservoir and economic conditions. Some of these variables are reservoir characteristics, the number and type of wells and their operating conditions and above all the underground uncertainty (Martini, 2004).

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