

Production Optimization in the Duke Field Using the IPM Suite

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DOI

<http://dx.doi.org/10.2118/184311-MS>

Document ID

SPE-184311-MS

Publisher

[Society of Petroleum Engineers](#)

Source

SPE Nigeria Annual International Conference and Exhibition, 2-4 August, Lagos, Nigeria

Publication Date

2016

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SPE Member Price: USD 8.50

SPE Non-Member Price: USD 25.00

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Abstract

This project focuses on building a reservoir sub-sea network model for a condensate field in the gulf of Guinea, the Duke Field. It integrates the five developed Duke reservoirs, development wells and subsea network using the Petroleum Experts' Integrated Production Model suite of software, (IPM) which is widely used in the E&P industry especially for integrated forecasting, surveillance and production system optimization that require integration of surface and subsurface models.

Following the acquisition and quality control of data from other teams working on the Duke Field, a network model which integrates the five Duke reservoirs, their associated wells and subsea network up to the production separator was built. The model was initialized and used to predict full field performance under different scenarios.

Finally, a water injection allocation sensitivity study was performed and the results were analyzed both technically and economically. From the technical point of view, the option to reallocate 10 kbwpd from reservoir U to reservoir P-upper North and another 10 kbwpd from Reservoir ST to reservoir Q-Lower brought about the optimum recovery. This was also supported by a simple economic analysis. It was then recommended that additional water injectors be drilled in P-Upper North and Q-Lower to unlock an additional 8.4 MMSTB of reserves resulting from higher sweep efficiencies and better pressure maintenance.

File Size 2 MB **Number of Pages** 8

