727747 Reservoir Characterization of Fadhili Reservoir, Bahrain Field -A Case Study

Faqihi, Masoud [1]; Govinda Rao, R. N.[1]; Kumar, Suresh [1]; Jaber, Ebrahim [1]; Baqer, Habeeb [1]; AL-Muftah, Ali E.[1]; Kumar, K. [1] (1) Bapco, Awali, Bahrain.

This paper describes a practical approach that led to improve the production from one of the un-exploited reservoirs in the Bahrain Field and increased its potential recovery. The Fadhili reservoir, a middle Jurassic carbonate, is about 185' thick and overlain by tight Dhruma limestone, with an oil column of 50-70' in thickness. The reservoir quality is good in the top 3 stratigraphic layers but progressively deteorites towards the base of the reservoir. The low formation resistivities in the oil bearing zones are attributed to the high formation water salinity, which makes the formation evaluation difficult.

Vertical wells begin production with low water cut, which gradually rises to more than 95% during the course of production. Six vertical wells drilled in this reservoir have produced 156 MMSTB of oil as of date.

Initially, based on the poor performance of the vertical wells, the Fadhili was thought to be a poor prospect. However, a simulation model built to study the production behavior of the reservoir indicated that the production potential can be increased if an appropriate well type is chosen for this reservoir.

Based on this study, to ensure maximum reservoir contact, a horizontal well was drilled, targeting the top 10-20' of the oil column, to evaluate oil production potential of the reservoir. During the last six months, this horizontal well alone has produced more than the total production of all the 6 vertical wells put together drilled in the past.

The encouraging production results (high on oil/low on water) prompted a review of the geological model and petrophysical properties of the reservoir for a) better reservoir characterization, b) identifying reservoir flow units and c) estimation of reserves. This paper highlights the results of the study.

NO
FULL PAPER
AVAILABLE