

Exploitation of Untapped Oil Through Conventional Inclined Wells in a Multilayered Giant Offshore Carbonate Field - A Case Study

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The carbonate formations of Mumbai High field are the most prolific oil reservoirs in India. These Miocene carbonates are very complex in nature in terms of reservoir heterogeneity. The Mumbai High South (MHS) field was put on production in October 1980 and, by Sept 2010, has produced 263.8 MMt of oil, which is about 26.6% of the in-place oil. The main pay zone L-III is a multi-layered limestone reservoir with a large gas cap and partial water drive. The field is under water injection for the last 25 years for reservoir pressure maintenance. Presently, some of the layers are producing with high water cut and high GOR leading to decline in oil production.

A philosophy of phase-wise efforts is being followed to improve recovery of the hydrocarbon reserves of MHS field. During the Phase-I redevelopment plan, which commenced in 2001, the oil production decline was arrested and the production increased from a level of 131000 bpd in June-01 to 173000 bopd by the beginning of 2007. The recovery improvement strategy incorporated reduction of inter-well spacing through infill drilling and improvement in water injection to enhance areal sweep.

Adopting a similar approach, the Phase-II redevelopment input plan has been put into action in MHS from April-2007. Targeting the zones and patches of untapped oil, infill wells were planned through four new platforms. This paper focuses on inclined conventional wells planned through one of the new platforms, named here as 'A'. The platform was installed with 12 slots but initially only five wells were planned and drilled to generate the data for the new locales for better placement of wells through the remaining seven slots. All the five locations were drilled in 2009 and the wells are producing @ 2500 bopd against the planned rate of 2300 bopd.

The present study has shown that placement of the wells based on detailed analysis of available geoscientific data of nearby area can yield encouraging results, as confirmed by the performance of the conventional inclined wells drilled. The data generated from these wells would help in selecting appropriate layers for drilling and completion of the remaining wells on the platform and help in further enhancing the production of MHS.