Paper 8

Application of Improved Oil Recovery Strategies in Tapis Field, Malay Basin

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Abstract

The Tapis field, first drilled in May 1969, is the earliest discovered oil-bearing structure in offshore Peninsular Malaysia. The field began its oil production in 1978, and reached a peak rate of 80,000 barrels per day. To date, about 90% of the original development estimated recoverable oil reserves have been produced; large gas caps still remain for future development. The recovery mechanism has been primarily from line drive pattern waterflood. Continuous implementation of improved oil recovery (IOR) strategies has increased the recoverable reserves and production capacity for economic operation of the field. This paper describes some of these IOR work programs that have added more than 25% reserves to the field. These work programs include rig workovers, infill/step-out drilling from existing platforms, and installation of new satellite platforms.

The Tapis structure is an east-west trending anticline, approximately 16 km long and 7 km wide, with oil reservoirs mainly comprised of the Lower Miocene Group J marginal marine sandstone deposits. Initially, only the northern and major portions of the eastern areas were developed from four platforms, namely, A, B, C and D. The other areas were only developed in recent years, following studies to re-assess recovery from relatively thinner oil columns and marginal quality reservoirs. In addition, the application of more cost-effective technologies was also evaluated. This led to a fifth platform, E, that developed the western area of the field.

More recently, the southern flank was developed from the sixth platform, F, which adopted the minimal facilities satellite platform concept. This development was a result of detailed integrated reservoir studies that involved integration of newly re-processed 3D seismic data, additionally acquired exploration and development well data, and 3D geological and reservoir modeling. Further modeling effort also leads to the identification of additional infill drilling and workover opportunities in the eastern area of the field. The latest simulation study was conducted using finer layers and unstructured grids, incorporating over 25 years of production history. The positive results provided justification for Tapis C infill drilling program, which was completed in September 2005. A workover program is currently being matured.

Ideas to further improve oil recovery in the Tapis field continue to evolve and be put to the test. Time and history have proven that additional potential in this mature field can be unlocked. With the combination of a dedicated multi-function team, continuous strong support from management and constructive encouragement from stakeholders, extending the economic production life cycle of the Tapis field is an achievable mission.