ABSTRACT

OPTIMIZATION OF POLYMER INJECTION IN ADVANCED SCENARIO OF NATURALLY FRACTURED CARBONATE RESERVOIR FIELD "SA"

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Field "SA" is a naturally fractured carbonate oil reservoir with a solution gas drive mechanism. It has an Original Oil in Place (OOIP) of 101.72 MMstb, with a cumulative oil production from 2005 to 2016 of 6.4 MMstb, a recovery factor of 6.29%, and a cumulative gas production of 22 Bscf. The field has 13 wells, including 4 exploration wells and 9 production wells. The lithology of Field "SA" exhibits characteristics of dual porosity and dual permeability in the carbonate rock. The study of "SA" Field using the injection of waterflooding and polymer.

The study of Field "SA" began with data processing and variations in polymer concentration, along with converting three production wells into injection wells. The stages of the field simulation included data preparation, polymer screening criteria, inputting polymer concentration data into the reservoir, and creating field development scenarios with polymer injections. From the variations in polymer injection concentrations at Field "SA," an evaluation was performed to determine the optimal polymer injection results.

Reservoir simulation in this study utilized the tNavigator simulator with 5 scenarios. Scenario I, the basecase, resulted in a cumulative oil of 7.913 MMSTB with a recovery factor of 6.86% and cumulative gas of 5.64 BSCF. Scenarios II to V represented waterflooding scenarios, producing a cumulative oil of 7.820 MMSTB with a decline in recovery factor of 1.18%. Among these scenarios, the basecase is the most recommended for Field "SA" due to the higher reservoir oil heterogeneity, which results in a decreased recovery factor when polymer is injected.

Keywords: Polymer Injection, Carbonate Rocks, Reservoir Simulation