Upper Jurassic Sedimentary Evolution and Oil Plays in the Sureste Basin of México

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ABSTRACT

Oil production from Upper Jurassic reservoirs started in 1977. The most recent oil discoveries are the trigger to update the geological model of these plays.

Our work integrates different geological analyses and its calibration and correlation around the basin to establish the sequence-stratigraphic, sedimentological, and structural framework. The Kimmeridgian and Lower Tithonian carbonate rocks were deposited in a wide ramp with facies belts oriented SW-NE, from east to west the environments are: tidal flats, lagoon (inner ramp), middle ramp, and outer ramp. From Middle Tithonian onward, the environments are increasingly deep.

The most important facies are associated with topographic highs created by salt piercement: oolitic shoals are widely distributed in the middle ramp high energy environments, biogenic shoals are common in the inner ramp lower energy zone, and tempestite accumulations occur in the outer ramp. All of these facies have been affected by diagenetic processes that created secondary porosity, which combined with matrix porosity make them excellent reservoir rocks.

Comparing the former play indicators versus the ones obtained by this work, the geological success probability (Pg) improved in 26%; the number of commercial discoveries expected in the play increased 31%; the commercial discoveries average volume grew by almost 100 %; and the prospective resources of the play increased 150 %.

These evaluations, combined with many other criteria, will allow us, in the short and medium term, to design the most suitable exploratory strategies.

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