

IPTC 10450

## Seismic Sequence Stratigraphy and Reservoir Distribution of the Early Cretaceous Habshan Formation in the UAE

N. Al-Zaabi, Abu Dhabi Oil Co. Ltd., and C.J. Strohmenger, W.L. Soroka, J. Dervieux, M. Abdelsattar, R. Rosell and S. Ali, Abu Dhabi Co. for Onshore Oil Operations

This abstract was prepared for presentation at the 2005 International Petroleum Technology Conference held in Doha, Qatar, 21–23 November 2005.

### Abstract

A team approach consisting of structural, sequence stratigraphy, inversion specialists, geologists and geophysicists enabled a successful interpretation of the Habshan reservoir potential.

The Early Cretaceous Habshan Formation of Abu Dhabi was deposited on a broad carbonate shelf. In east onshore, this formation consists mainly of limestones and dolomites reaching thickness of more than 1,100 feet. The depositional environment ranged from shallow water peritidal to deep shelf basin.

The Habshan Formation is part of the early transgressive sequence set of a second-order supersequence (top Upper Jurassic to top Habshan Formation), built by two second-order composite sequences. The lower second-order composite sequence comprises two third-order composite sequences (Habshan sequences Ha0 and Ha1), corresponding to the transgressive and highstand sequence sets. The upper second-order composite sequence is built by three third-order composite sequences (Habshan sequences Ha2, Ha3, and Ha4), corresponding to the lowstand (LSS), transgressive (TSS), and highstand (HSS) sequence sets. High energy, shelf margin ooid-skeletal grainstones are the main reservoir facies and show overall progradation towards the east.

Reservoir in Habshan sequences has been proven HC-bearing in several onshore fields. Using high resolution 3D seismic data, Inversion, very recent fault detection tools, regional geologic control and seismic stratigraphy techniques, the Habshan Formation was successfully mapped. The main reservoir facies and potential prospects appear as low acoustic impedance anomalies with geometries consistent with modern day oolite shoals. Using both structural and stratigraphic considerations the porous Habshan layers identified in the interpretation were evaluated for hydrocarbon potential.

This study improved our understanding of the Habshan reservoir distribution and allowed a better evaluation of the HC potential in this formation as a consequent several new leads which added to exploration Portfolio.