Monday, February 9, 2004

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Stratigraphic Evolution of the Magnolia Field and Surrounding Area, Garden Banks Blocks 783 and 784, Deepwater Gulf of Mexico

The Magnolia Field is located along the southern edge of the Titan mini-basin where multiple deep water reservoir sands are positioned across a series of down-to-the-basin and antithetic faults adjacent to salt bodies. Reservoirs are of Miocene, Pliocene and Pleistocene age. Sand body geometry is related to the interplay between structural movement and sediment input both in time and space.

Sand bodies are defined within a sequence stratigraphic framework. Sequence boundaries are identified at the base of sand-prone intervals observed in well logs and 3D seismic data. Nannofossil and foraminiferal abundance and diversity data suggest that true maximum flooding surfaces are rarely preserved. Flooding surfaces are probably truncated or removed by erosional surfaces associated with sea-level low-stands and zones of re-sedimented microfossils.

Similar to other central Gulf of Mexico intra-slope basins, Magnolia can be subdivided into ponded, transitional and bypassed depositional phases. A ponded phase extends from the Miocene to the Plio-Pleistocene boundary and consists primarily of sheet sands that thin or onlap salt bodies. The latest Pliocene depositional axis is oriented from west to east. Stratigraphic architecture changes dramatically across a sequence boundary separating ponded Pliocene fill from lower Pleistocene transitional fill. This marks a period when an exit point formed to the south and the depositional axis assumed a north–south orientation. A typical lower Pleistocene sequence consists of basal sheet sands overlain initially by erosional, amalgamated channel and later by constructional channel sandstone and mudstone corresponding to the abandonment phase of deposition. ■

Biographical Sketch

Geoffrey Haddad joined ConocoPhillips Upstream Technology in 2001 as a member of the Integrated Geological Analysis Group in Houston. Before joining ConocoPhillips he worked at the Technology Center for TotalFinaElf (TFE) in Pau, France, at Exxon Exploration in Houston and at the Superior Oil Company in Houston. Geoffrey has also worked as a scientist at the Houston Advanced Research Center in the Woodlands and at a CNRS Paleoclimate Laboratory in Gif-sur-Yvette, France. Geoffrey earned a PhD in Geology at Rice University in 1994, an M.S. degree in Geology at Duke University in 1986 and a B.S. degree in Geology at Rice University in 1982.

Geoffrey has extensive experience working on the prediction and characterization of deepwater turbidite reservoirs. He was responsible for mapping deepwater reservoirs for TFE's New Ventures group in offshore Brunei, Barbados, Nigeria and Equatorial Guinea. He also identified and mapped deepwater prospects and provided reservoir modeling input for deepwater Congo and Gulf of Mexico.

Geoffrey is currently working in the Stratigraphic Prediction and Analysis team at ConocoPhillips where his responsibilities include integrated seismic and well log stratigraphic analysis to predict deepwater reservoir occurrence. While at ConocoPhillips Geoffrey has worked on exploration and development projects in the western Mediterranean Sea, the North Sea, offshore Brazil, and the Gulf of Mexico.