**Monday, April 21, 2003**

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## International Explorationists Dinner Meeting

*by **John Ardill, Ting Chang Huang** and **Orla McLaughlin***
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# The Stratigraphy and Reservoir Architecture of the Oligocene to Miocene Malembo Formation of the Lower Congo Basin, Offshore Angola

A stratigraphic framework based on the detailed integration of well data and regional seismic stratigraphy, seismic facies analysis, and biostratigraphy is presented for the Oligocene to Miocene Malembo Formation of the Lower Congo Basin. The Malembo Formation was deposited in a deep-water slope environment characterized by hemipelagic shales, with generally east–west trending confined to distributary deep-water systems. The extensive 3D seismic data (~20,000 km2) and ~50 well penetrations are coupled with high-resolution biostratigraphy to provide a comprehensive dataset covering a significant portion of the Lower Congo Basin.

The Malembo Formation contains several low-frequency megasequences (3–10 My) characterized by sand-prone lowstand deposits and shale-prone abandonment deposits that can be mapped regionally within the basin and control the major reservoir and seal play elements. The megasequences are in turn composed of composite sequences (0.5–3 My) and high-frequency sequences (0.1–0.5 My) that control lithofacies type, reservoir distribution, and reservoir architecture within the deep-water systems. The Oligocene to Miocene reservoirs contain both turbidite and debris flow deposits that display an overall fining-upward succession from gravel-dominated in the Oligocene, mixed gravel and sand in the Lower to Middle Miocene, to fine to medium-grained sand in the Upper Miocene.

The Malembo Formation is presented with eight new members based on European Basins stratigraphic nomenclature in which each member contains one to four composite sequences. The framework promotes internal consistency and provides a basis for a more detailed regional understanding of the Oligocene to Miocene succession. The proposed stratigraphic framework provides an understanding of semi-regional seals and reservoirs that is an important aspect of exploration, development, and production geology. ■

### Biographical Sketch

JOHN ARDILL currently works for ExxonMobil Technology in Houston as the team lead of the Deepwater Reservoir Interpretation and Prediction Best Practices Project. Over the past 7 years with ExxonMobil, John has worked in exploration, development, production, and research. For the last 5 years he has been focused on deep-water reservoir characterization in West Africa. John joined ExxonMobil in 1996 after completing a PhD at the University of Liverpool in England under the guidance of Dr. Stephen Flint and a BS at the University of Edinburgh in Scotland under the guidance of Dr. John Underhill.