AAPG International Conference
Barcelona, Spain
September 21-24, 2003

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The Ara and Haima Plays in Oman - Exploration for Oil and Gas in Terminal Neoproterozoic and Lower Paleozoic Reservoirs

Exploration for Lower Paleozoic sandstones of the Haima Supergroup in north Oman basins and uppermost Neoproterozoic (Ediacaran) carbonates and silicilytes (Ara Group, Huqf Supergroup) in the South Oman Salt Basin has yielded and continues to yield significant hydrocarbon reserves. The Haima gas/condensate plays comprise three main types - each charged by Huqf source rocks. The first is the proven Haima structural play characterized by Lower Ordovician (Barik Mbr, Andam Fm) and Upper Cambrian sandstone reservoirs (Miqrat and Amin Fms) sealed by marine shales of the Mabrouk and Al Bashair Mbrs (Andam Fm) and Miqrat Fm shales in structural traps. The second type is the Barik stratigraphic play characterized by generally south-north facies transitions (i.e. pinch-outs) in the Makarem high area of northern Oman. The third type is the Safiq/Ghudun play characterized by Upper Ordovician Ghudun Fm sandstones overlain by marine shales of the overlying and intertonguing Safiq Shale in structural, and possibly, stratigraphic trapping configurations.

In the South Oman Salt Basin, and possibly in the salt-basins of Northern Oman, an Ediacaran - early Cambrian carbonate play has re-emerged. This is the Ara carbonate play, characterized by carbonate slabs (termed "carbonate stringers") encased and sealed in halokinetically deformed salt (i.e. halite) bodies. Although the carbonate stringers are, at present, isolated within the remnant deformed salt bodies, seismic and well correlations suggest an organized cyclic stratigraphy and depositional evolution. The Ara stringers contain both oil and gas charge, which has likely migrated from deeper Huqf source rocks. Successful exploration and exploitation of Haima clastic and Ara carbonate and related plays require good seismic imaging (eg 3D PSI and PSDM), deep drilling (4000 - > 7000 m) and the ability and willingness to continuously push the envelop of geologic understanding.