*by Ian Davison,*
*Earthmoves Ltd. Virginia Water, UK.*

# Hydrocarbon Potential of the Brazilian Atlantic Margin

## Introduction

The Brazilian Atlantic Margin is currently undergoing a revolution in the level of knowledge and activity since opening up to foreign oil companies. The acquisition of new high-quality seismic data in deepwater will provide a great impetus to exploration in the next decade. Drilling technology has improved so that we can now consider exploring in water depths of 2-3 km. This opens up huge areas that have never been considered before and where there is very little seismic data. The 3rd ANP Licensing Round is offering many blocks that fall into this category.

This talk will review the main aspects of the geology of the Atlantic margin from the earliest rifting events in Berriasian times to the recent mass wasting that has caused mega-slumps in areas such as the Amazon Fan and the Sergipe-Alagoas Basin. New frontier areas offered in the 3rd Licensing Round in Brazil will be examined, along with areas that are expected to be offered in the future.

## Future Hydrocarbon Potential

Deepwater areas (>1000 m water) outside the Campos Basin have not been explored yet. The main reservoir targets will be Cretaceous and Tertiary turbiditic sandstones. These reservoirs are structured by downslope sliding on detachments at various levels. Roll-over anticlines are the main traps in water depths up to 1500 m, and deeper than this compressional fold and thrust belts are developed. Detachment can occur on Aptian salt, from the Santos Basin in the south to the Ceara Basin in the nouth. Multiple detachments also occur at Top Albian, (e.g., Para-Maranhao, Barreirinhas) and within Upper Cetaceous and Tertiary deepwater shales. When detachments occur at Tertiary level, migration of hydrocarbons from the syn-rift source can be a problem. Upper Cretaceous to Tertiary source rocks may be necessary for charging these reservoirs. The quality of the Upper Cetaceous to Tertiary sources on the Brazilian margin appears to be inferior to their African equivalents owing to asymmetric upwelling of colder water. However, new geochemical studies suggest post-salt source rocks can produce oil in some basins (e.g. Foz de Amazonas and Espirito Santo). Biodegredation of oil in turbidite sandstone traps situated at levels where present-day temperatures are less than 80°C is a significant problem in deepwater exploration outside of the main Tertiary depocenters. Besides turbidite reservoirs in deepwater, attractive secondary targets exist in large rotated fault blocks, which may contain syn-rift reservoirs and source rocks. These have yet to be tested in deepwater.

## Biographical Sketch

IAN DAVISON spent five years in Brazil lecturing at the Federal University of Salvador, Bahia and consulting on a regular basis for Petrobras. He returned to the UK in 1989 and taught structural geology and basin dynamics at Royal Holloway University of London for 10 years. During this time he also worked as a consultant on Brazilian basins, for over 60 different companies. He has recently become a full time consultant specializing on Brazil, South Atlantic conjugate margin reconstructions and salt tectonics.

Contact details: I. Davison, Earthmoves Ltd. 8 Cabrera Avenue, Virginia Water, Surrey, GU25 4EZ, UK. Tel. +44 1344 842967. email: i.davison@earthmoves.co.uk Web site http://www.earthmoves.co.uk □

HGS International Explorationists Meeting • Monday, February 19, 2001 • Westchase Hilton, 9999 Westheimer, Social 5:30 p.m., Dinner 6:30 p.m.