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by ***Scott E. Thornton,*** *Shell International E&P, Inc.,*
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Brazilian Deep Water Fold Belts: Tectonic Drivers and Structural Styles of Potential Traps

Deep water fold belts in the emerging and frontier basins in Brazil are structurally quite different than those more explored Santos, Campos, and Espirito Santo basins (the Southern Salt basin). One key difference is the nature of the mobile substrate. In the deep water fold belts of the Equatorial Margin and extreme northeast Brazil, little salt exists in the deep water continental margin, although shallow water salt is penetrated in the Potiguar and Sergipe-Alagoas basins. As a result, mobile shales, sometimes overpressured, provide the base of the décollement(s). Structural imprints from breakup of the North and South Atlantic provided strong contrasts in structural fabric of the continental margin separating fold belts into two generic sectors: 1) southern sector from Cumuruxitiba to Parnaiba-Pernambuco basins, where roughly east-west rifting occurred, and 2) northern sector along the Equatorial Margin from the Ceara to the Foz do Amazonas basin, where North Atlantic oblique rifting initiated Berriasian rifts and later drifting. Some limited parts of the Equatorial Margin also have Triassic rifts, akin to eastern North America. Fold belts and their contiguous listric-faulted nearshore structural zones will be dissected from the south to the north, from the Cumuruxitiba to the Foz do Amazonas basins.

Major tectonic drivers and structural controls for formation of these fold belts will be discussed relative to the general stratigraphic section in shallow and deep water. In addition to Campanian uplift, Middle Eocene and Late Middle Miocene Andean orogenies have triggered fold belt formation. The lack of significant exploration in these deep water fold belts points to potential in high-risk and potentially high-reward structural segments. ■

Biographical Sketches

Scott E. Thornton (speaker) has worked for Shell, Unocal, and Independents, generating exploration evaluations and regional studies of the South Atlantic continental margins. He has worked Brazil since 1992, including four bid rounds. In addition, he has conducted block/prospect evaluations, regional studies, and well operations in offshore North Alaska, offshore Southern California, South Asia, SE Asia, China, Australia, and the Subandean Zone in South America. He currently works as a contract consultant in Shell International E&P, Inc. on Brazil exploration. Scott's prior fold belt experience has been in onshore Pakistan, onshore and offshore western Burma, Ecuador, Peru, and offshore north Alaska.

Peter Mullin is currently Exploration Director for Amerada Hess's Brazil group, a part of Hess's South Atlantic Margin Team. Prior to joining Hess this year, Peter worked for some 24 years with Shell, primarily on exploration new ventures in South America and West Africa. He was Shell's exploration manager first for Angola and then Brazil (working all the Brazil bid rounds), and most recently was Shell's Head of Evaluation for Trinidad. In addition to South Atlantic margin basins, he has worked the Subandean fold belts in Bolivia, Peru, Columbia, Venezuela, and Trinidad and the Barbados accretionary prism in the Caribbean.

Dave Stewart is Team Leader, Brazil Team, Subsurface Evaluation, Shell International E&P, Inc. in Houston. Dave has worked Brazil since Bid Round 0 and, in addition to coordinating Bid Round Evaluation, has performed both regional and prospect analysis throughout the Brazilian marginal basins. Dave came to Shell from Robertson Research to join The Group's seismic stratigraphy effort in the Research Centre in Rijswijk, Holland. Dave has also had assignments at Shell on the Norwegian and British North Sea and the Gulf of Mexico.