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McCone Hall 265, UC Berkeley

**Title: Tectonics, Imaging, and Hydrocarbon Potential of
Passive Rifts:**

Examples from S. Atlantic and E. African Margins

Abstract: During the last decade, several oil and gas discoveries have been made along the South Atlantic Passive Margin offshore West Africa and Brasil, and along the East African margin of Mozambique and Zimbabwe. The East African Rift system of Ethiopia, Kenya, Uganda, and Malawi, initiated in the Miocene, provides a reasonable analogy for the beginning of the rift geometry seen in the African margin plays. Correlations can be made with the source rock and reservoir sections along both Atlantic margins, which have been excellently imaged with 3D seismic data.

The basic geometry includes pre-rift and stretched continental crust, overlain by syn-rift, usually lacustrine, facies which is often topped by an angular unconformity (the breakup unconformity). The unconformity is easily seen on properly processed 3D seismic. Often, the syn-rift section has a working petroleum system consisting of

lacustrine source rocks and deltaic or carbonate reservoir facies. Elongate structural traps, semi-parallel to shore, can be formed on the rift half horsts. However, these only become visible after correcting for the seaward thickening wedge of water and submarine channels, usually via pre-stack depth migration of the 3D seismic.

This is then overlain by the first incursion of marine waters after thermal subsidence, sometimes called the sag sequence, in many places represented by pelagic shales or thick evaporite deposits, which form a seal to the syn-rift petroleum system. Finally, thick seaward dipping drift sequences are deposited as the passive margins move away from each other, with new oceanic crust emplaced seaward. The sag and drift sequences in many places have a petroleum system separate from the syn-rift.

This talk will review rifting examples from the East African rift, reconstructions of the South Atlantic opening and East Africa openings, and field examples for the Atlantic margin petroleum systems within the various rift sequences.

Short Bio:



Spencer Quam has recently returned home after 38 years experience in the Upstream Oil and Gas Business. He is currently Principle at Quam Energy Development, an International Oil and Gas Consultancy. Experience includes Exploration and Development projects in 22 countries, many in-country, in North America, Austral-Asia, Africa, South America and Europe. Last assignment was as Chief Geologist for Galp Energia in Lisbon Portugal.

He holds a BSc in Geology from Western Illinois, MSc in Geophysics from Stanford, and an MBA from St. Mary's College. He is a member of multiple professional societies, a fellow of the Energy Institute, a UK Chartered Scientist, and California Registered Geologist and Geophysicist. He is also a volunteer on the Stanford Petroleum Investment Committee, the Professional Development Committee for the Energy Institute in the UK, and a former member of the Graduate Business School Alumni Board at Saint Mary's.