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Application of Paleogeographic Maps for New Play Development in West Africa

A series of new paleogeographic maps of the Salt and Pre-salt basins extending from southern Angola through Gabon will be used to illustrate a framework for generating new plays and pursuing successful plays into new areas. These maps were developed from a regional perspective gained in part from 50,000 km of recent WesternGeco deep and ultra deepwater Spec 2D seismic data. Paleogeographic maps for Syn-Rift (Neocomian), Sag (Barremian), Salt (Aptian) and Drift (Albian) will be presented.

A key factor for developing new plays in the Aptian Salt Basin of West Africa (and Brazil) lies in understanding the pre-salt and the geologic framework that controls distribution of its rich source rocks. Other key factors include recognition of westward migration of rifting through time and associated linkage and abandonment of major faults that produced syn-rift highlands and basins. These highlands influenced sedimentation into the Post-salt and even into the Early Tertiary.

The high rate of exploration success along West Africa's margin is due to multiple active petroleum systems, and abundant 3D Spec seismic surveys. Exploration risk is lowered when new plays and prospective areas are evaluated based on identifying active petroleum systems. A new petroleum system, proposed based on this paleogeographic mapping, was recently verified by a discovery in southern Angola. Petroleum systems can be predicted using regional seismic data and the framework provided by paleogeographic mapping.