

New Insights of the Gambia Basin Potential using 2D and 3D seismic data

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Numerous discoveries offshore West Africa have driven exploration of new hydrocarbon opportunities in the margin. The Gambia Basin is part of the Senegal Basin in the North Western Atlantic margin of Africa. Limited exploration of Basin includes one well, Jammah-1 drilled by Chevron Overseas in 1979, one 3D seismic volume shot by WesternGeco, covering 500Km², in 2003 and one 2D seismic survey (18lines)

Description and evaluation of the frontier basin is possible by seismic data analysis and seismic attributes evaluation, together with maturity modelling. Play potential of the basin is limited to the major seismic sequences of the Upper Jurassic to Lower Cretaceous, Middle to Upper Cretaceous, Upper Cretaceous, Lower Tertiary and Upper Tertiary to Holocene.

Turonian-Cenomanian Source Rocks evaluation suggests that maturity starts at 2400m below sea bottom deep offshore Gambia; in addition younger source rocks are probably located within the Oil Window. Generation possibly began in the Oligo-Miocene. Recognised play types in the basin are: truncated carbonate platform of the middle Jurassic-Lower Cretaceous; stratigraphic pinch-out and onlapping events characterizing the Middle to Upper Cretaceous plays. Moreover, Lower Tertiary plays include pinch-out and updipping depositional lobes and inter-channel deposits.

The carbonate platform and deep water clastic systems represent major reservoir facies offshore Gambia which are recognized by thorough description of seismic events. In addition, reflectors in the lower Tertiary sequence could be associated to well organized channels and lobes geometries. Potential Seals consist of intra-formational and/or hemipelagic regional marine shales. Migration is believed to occur directly and through porous sequences and/or fractures.

The investigation suggests that the Gambia Basin bears hydrocarbon potential based on a basic prospectivity assessment and that all conditions for generation and accumulation are present.