Using a West Africa Depositional Sequence Framework to Uncover Pre- & Post-Salt Prospectivity in the Underexplored Deepwater Congo and Namibe Basins

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ABSTRACT

Over the past two decades, exploration of the conjugate salt basins of West Africa and Brazil has followed play-trends, driven by technological advances and success at the drill bit. Pre-salt plays, successful in the shallower water areas of Congo, Angola and Brazil have been explored outboard whilst post-salt plays have been chased into deeper water. Both of these exploration trends have highlighted the necessity for improved seismic imaging, especially of the pre-salt sections, combined with a valid understanding of the depositional geology and reservoir characteristics. In the pre-salt basins of offshore Brazil and Angola, where reservoir qualities are seen to vary over small distances, depositional facies delineation and prediction is critical to exploration success. Similarly, in the post-salt section a firm understanding of the depositional environments, together with identification of the depositional facies and reservoir fluids, is key to identifying and de-risking new prospects. The application of a depositional sequence framework to the pre- and post-salt sections of the basins offshore West Africa, built using well and seismic data, enables geologists to compare play models and depositional styles to conjugate and neighbouring basins. Geologists can further use this framework to constrain the modelling and prediction of depositional facies and reservoir-fluid characteristics away from well control. In this presentation, new dual sensor streamer, broadband datasets from the offshore Congo, Kwanza and Namibe basins will be shown and the sequences, plays and facies that these illuminate will be explained. Examples will be shown of pre- and post-salt imaging, together with the enhanced understanding of the reservoir facies and reservoir properties that these datasets permit. Additionally, the results of preliminary quantitative interpretation (QI) studies, using pre-stack seismic inversion and constrained by a depositional sequence model will be shown, illustrating the potential for reservoir and fluid attribute modelling.