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Integrating Flow Character defined from Shaly Sand Analysis into Detailed Reservoir Models at Negage Field, Deepwater Angola

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The Negage 1 discovery well was drilled in September 2002, in over 4700' water depths, south of the current Congo Canyon in Block 14, offshore Angola. The discovery was another in a series of Miocene sand filled turbidite channel reservoirs that have been discovered in Block 14 over the past several years. The high cost of developing these deep water assets makes it essential to adequately assess the recoverable pay associated with each field.

One of the major challenges in defining the reserve base at Negage was distinguishing the actual net pay in the Negage 1 well. The well encountered an oil column of over 300', with low resistivity, high gamma "shaley sands" making up a large portion of the reservoir interval. Conventional shaley sand log analysis integrated with information from new logging tools such as "3DEX" resistivity were used to provide an accurate interpretation of the resource encountered in the well. This technique helped to determine whether "laminated" or "dispersed" clays were expected in our reservoir at Negage and provided critical information about flow character for our model building process.

Although the seismic data in the Negage field is extremely good, it still does not have the resolution to adequately define the fine-scale sand architecture seen in the Negage 1 well. Thin bedded models below seismic resolution, were generated using a combination of principle component seismic attribute analysis (PCA) along with sequential gaussian simulation and object-based multiple-point statistics.

This poster describes how we used integrated core and log analyses to distinguish between dispersed and laminated clays in the discovery well. This information was then used to determine recoverable oil in place volumes and define the probable flow characteristics associated with our shaley sand intervals, that were integrated into our 3D reservoir models.