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Evidence for Low-angle Sub-horizontal "Hanging" Faults in Rotated Fault Blocks, Cabinda, Offshore Angola

The Cretaceous in Block 0, Cabinda, offshore Angola is separated into a Pre-Salt lacustrine section and a Post-Salt marine dominated section. A thick layer of marine derived evaporite, the Aptian Loeme Salt, separates the two systems.

The base of the Loeme has acted as a décollement glide surface. A series of large listric faults with down-to-the-southwest motion has allowed the Post-Salt section to slide or glide downslope as a series of large rafted blocks. Rotation of the Post-Salt section during gliding has produced a series of roll-over anticlines in the Albian Pinda Formation which form traps for hydrocarbons. The large listric faults are observed on seismic data to sole out at the base of the Loeme. It is generally believed that the Post-Salt listric faults do not penetrate into the Pre-Salt section.

Interpretation of high quality 3D seismic has documented a second set of faults. These faults also exhibit throw in a general down-to-the-southwest sense but do not sole-out at the base of the Post-Salt section. Rather the faults turn to a sub-horizontal position well within the Post-Salt section and serve to vertically segment the Pinda. In addition the down slope ends of this newly recognized sets of faults are cut off by larger regional listric faults and are thus left ‘hanging’ above the base décollement surface.

Seismic mapping and well control suggest that these sub-horizontal faults may act as vertical seals by juxtaposing Cenomanian Vermelha shales against Pinda sands as well as forming compartments within the rafted fault blocks.