

FAULT RECOGNITION AND SOUTH PASS BLOCK 61 FIELD

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Abstract

Faulting is probably the singlemost important factor affecting hydrocarbon accumulation, yet the recognition of faults in subsurface data remains more an art than a science. Evidence of faulting is found in every phase of exploration activity from drilling, to evaluation, and production. Criteria for fault recognition are established using this comprehensive approach.

South Pass Block 61 Field surrounds a shallow piercement salt dome located 5 miles offshore of the mouth of the Mississippi Delta. It contains 250 MMBOE of expected reserves in numerous, separate fault traps. The field was discovered in 1967 based on a gravity anomaly. Interpretable seismic data is virtually nonexistent because a thick envelope of low velocity modern sediments create imaging problems. Therefore, development has progressed based solely on well control.

Drilling parameters provide an often overlooked insight to structural grain. Tight zones, borehole breakout, doglegs, and significant increases or decreases in background gas or mud weight are all indicators of changing subsurface conditions that may be related to faulting. Stuck pipe is sometimes associated with drilling in a fault zone.

Log correlation is the fundamental method of fault interpretation. Biostratigraphic zonation provides critical independent control needed to establish missing or repeat section. Dipmeter and wireline pressure data provide valuable clues when available. Mapping should be consistent at all levels with preservation of dip and/or strike trends following a logical structural model.

Reservoir performance needs to be monitored to evaluate the validity of the structural interpretation. Changes in reservoir pressure, fluid contacts, or the geochemistry of produced fluids may indicate communication or separation between wells. Material balance and volumetrics are indicators of true reservoir size and therefore placement of sealing faults.

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