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# Fault Transmissibility in Gas Reservoirs

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Fault transmissibility reflects the ability of the fault rock texture to allow fluid to enter and flow from one side of the fault to the other. It is a function of the following: 1) Fault rock permeability 2) Fault zone thickness - 3) The fluid phases 4) Dynamic changes across the fault In the Columbus Basin shelf Trinidad and Tobago, the wall rocks are Pliocene and Pleistocene sand and shale deltaic reservoirs.

The typical fault rock found in the Columbus basin range from disaggregation zones, phyllosilicate framework rocks to both clay and shale smears. This study explores the transmissive behavior of faults within self-juxtaposed gas bearing reservoirs under production in the Columbus basin shelf. The study uses production, pressure data, reservoir engineering models and fault rock analysis, to determine fault transmissibility. These models showed gas systems with the weaker aquifer support are more transmissive across the faults for most of their life. It was found that stronger water drive systems are less transmissive through intra- reservoir faults.

This behavior is attributed to two reasons, one being pressure drawdown across the fault leading to breakdown of fault baffle and the other being the interactions of the aquifer and the fault zone, where the fault acts as a barrier to flow, and the aquifer is preferentially channeled up one side of the fault. These and other examples from the Columbus Basin support the hypothesis that drive mechanism in gas reservoirs significantly affect the transmissive behavior across faults. It also shows the importance of performing fault Qc, length vs throw and throw plots to understand faults and whether the faults can be split into smaller faults allowing for flow across and around them. Fault position with respect to the water leg is also thought to have an impact on fault transmissibility of gas.