

Variable Structural Style Along the Furrial Trend, Implications for the Development of these Giant Fields, Norte de Monagas, Venezuela

J-Y. Chatellier, Consultant to PDVSA intevop
M.E. Rueda and S. Olave, PDVSA Oriente, Puerto La Cruz

The Furrial trend is essentially composed of three giant oil fields with reserves of about 26 MMMbbls and 50 TCF. The area is systematically divided in portions of very similar sizes and characteristics. In each of these 10km wide fields stratigraphical correlation is relatively easy in the eastern half and very difficult in the western half. Four phases of deformation have been identified that are: 1) a compression from the NW creating a very large structure later filled by hydrocarbon, 2) a compression from the NE, 3) a compression from the NW associated with the Pirital thrust emplacement and 4) a W-E extension.

The variation in structural style between the Furrial, Carito and Santa Barbara fields is related to the distance to the Pirital thrust. Furrial, the furthest away from the fault corresponds to a very simple near perfect Fault Bend Fold. Carito is more complex, especially in its western part where important thrusting and Fault Propagation Breakthrough took place. Santa Barbara, the closest to the Pirital fault is unlike the other two because the out of sequence Pirital thrusting could not overcome a relief created by reactivated faults; that resulted in a major “decapitation” and gliding of the field towards the SE.

The second Phase of deformation (NE) is well expressed in Santa Barbara and buried in the other two fields because of phase 3 thrusting. The subtle seismic and geological expression of phase 2 in these two fields will be discussed alongside the limits between the fields.