

Missing Sections Interpreted as Normal Faults Creating Problems to Geological Interpretation and Field Development, Examples from Strike Slip and Compressional Structures in Venezuela

J-Y. Chatellier, Consultant to PDVSA intevep

S. Olave and M.E. Rueda
PDVSA Oriente, Puerto La Cruz

Missing sections identified in wells are traditionally interpreted as the expression of a normal fault. Recent studies of large fields from Venezuela with very dense well control have shed a new light on other geological mechanisms that also produce missing sections. Five of these mechanisms will be discussed around outstanding examples from Norte de Monagas and Maracaibo Basins. Various newly conceived tools that allow identification of these anomalous structural features will be detailed and discussed alongside the description of the mechanisms involved e.g.:

- 1) Kilometric Strikeslip displacement along reverse faults masking repetition by bringing various coeval facies on either side of the fault: The Multiple Bischke Plot Analysis has been the only technique leading to the identification of the geological solution.
- 2) Oblique slip post reverse faulting (out of sequence deformation): Geometrical comparison of the fault plane against the sedimentary dip of the hanging wall led to the identification of out of sequence deformation responsible for the additional oblique slip observed.
- 3) Hectometric detachment associated with reactivated old major faults: Identification was possible by recognizing occurrence of fault intersections at the exact same depth as the major detachment lithological interface level.
- 4) Unconformity related missing sections linked to synsedimentary tectonic activity: exploration 3-D visualization and mapping the missing sections are the best methods to identify synsedimentary tectonic activity.
- 5) Large scale decapitation associated with out of sequence deformation: fault plane analysis showed the lateral changes from missing section to repetition, confirmation given by fault throw analysis.