

Strike-Slip Faulting Activities in the Tan-Lu Fault Zone and Their Relationship with Hydrocarbon Accumulation — An Example from Jinxian Area, Bohai Bay, China

Qinglong, Xia¹; Deng, Jinhui¹; Xu, Changgui¹ (1) China National Offshore Oil Corporation, Tianjin Tanggu, China.

The Jinxian oilfield is located in the inversed structure zone of middle Liaozhong sag in Bohai Bay area. It is divided into the eastern and western parts by the east branch of Tan-Lu fault belt. The Bohai segment of Tan-Lu fault belt has experienced a left-lateral strike slip movement during the early stage of late Cretaceous, and this is also the main period when the structures in Bohai Bay area were formed. The north segment suffered from the strike slip transpression due to the change of its trend and formed a structure framework with parallel NE-trend sags and uplifts developed.

The Bohai segment of Tan-Lu fault belt was subjected to right-lateral strike slip compresso-shear movement during the deposition of Paleogene Es1 and Ed due to the NNW-trend compression of Pacific Plate. As a result, Jinxian oilfield was uplifted successively during the end of Es and Ed period and Jinxian area became to an anticline with its axis parallel to the strike slip fault. These faults were normal faults in stretch stress background and formed under right-lateral wrench deformation by two strike slip faults. They were mainly developed during the period of Ed deposition, and were almost quiet in Neogene. Their range of lateral extension is larger, their movement periods were long, so these faults were the main oil and gas migration faults as they made the traps connected with the key source rocks in Es3.

Besides, the movement of these strike slip faults occurred during Paleogene Es1 and Ed period, when the main sandbodies developed, and therefore, also controlled the sandbodies' distribution in both horizontal and vertical direction. A fault subsidence furrow was formed in the downthrown side which became the entrance of old Fuzhou drainage system from Liadong provenance area in Jiaoliao uplift, and braided river delta front sandstones were widely developed. These sandstones migrated laterally as they were cut off by continual right-lateral movement of Tan-Lu strike fault and formed the 'fish jump' sedimentary model. The sedimentary bodies' distribution expanded constantly and was overlapped laterally, so the strike transfer zone was favorable place for sandy clast deposition. The sandstones were coupling well with strike adjustive faults and the petroleum migration path was readily available, which made it the key oil-bearing formations in this area.