

Fault Control on Migration Pattern And Reservoir Distribution in the Shengli Oilfield, China

Carolyn Lampe, IES GmbH, Integrated Exploration Systems, Bastionstr. 11-19, Jülich, D-52428, Germany, c.lampe@ies.de, Liangzi Cong, Paradigm Geophysical Ltd. Beijing Rep. Office, Chaoyang, Beijing, China, and Guoqi Song, Shengli Oilfield Company, Sinopec, Shandong Province, Dongying, China.

Shengli oilfield, the second largest oil and gas field in China, is a very important constituent part of the Bohai bay oil and gas basin. The investigated area of the continental Shengli Tertiary graben system consists of three petroleum systems, one for each mapped source rock. Those source rocks contribute petroleum to up to seven reservoir horizons, thus representing a complex migration/accumulation pattern. In addition, both the source and the reservoir facies are distributed unevenly throughout the system, requiring a complex distribution of possible migration pathways. Stratigraphic conduits, i.e. sandy and conglomeratic facies, are only given in the northern graben flank area, where coarse sediments provide possible migration pathways. For the most part of the basin, however, faults – active at different times throughout basin evolution – pose the most likely conduits for petroleum migration. The Shengli oilfield provides an excellent example of how 3D petroleum systems modeling allows the assessment of fault behavior and timing to predict the distribution of hydrocarbons in a system.
