

## **Hydrocarbon Accumulation of Neogene Shallow Water Delta: A New Model in the Yellow River Mouth Depression, Offshore Bohai Bay Basin, Eastern China**

Qinglong, Xia<sup>1</sup>; Lixin, Tian<sup>1</sup>; Wen xu, Peng<sup>1</sup>; Hefeng, Sun<sup>1</sup> (1) Tianjin Branch of China National Offshore Oil Company Ltd., Tianjin, China.

The Yellow River Mouth depression is a resourceful kitchen in the offshore Bohai Bay Basin. Recently many oil field of Neogene with nearly 3.6 hundred million cubic meter oil has been found in shallow water delta reservoir (depth from -1200 to -1800 meter) with medium crude oil density and high productivity (highly 455.3 cubic meter oil per day), approximately composed 60% the total reserves.

The oil mainly came from source rocks of the Paleogene Shahejie formation (E2S3) according to multiple biomarkers oil-source correlation. Hydrocarbon generation time of E2S3 formation source rocks was after 12.0Ma years by EasyRo model and especially since 5.1Ma years influenced by neotectonic movement. Charging time of main oil field was 5.1Ma later proved by homogenization temperature of reservoir inclusion. Multi-stages hydrocarbon-charging had happened within the Neogene sand layers by discrete figure of Th-Tm ice in BZ28-2S oilfield. Types of reservoir in Neogene are mainly river channel deposition of shallow water delta. Multi-stage developed meandering stream have formed large sand bodies nearly 100km<sup>2</sup> in BZ28-34 area and formed the main oil-bearing formations. The influence of Tanlu strike-slip to the Neogene's trap and oil migration is very important. A large number of adjusting faults with NNE directions were formed with strong right-lateral strike-slip during neotectonic movement. Adjusting faults are dominant migration pathway from depth to shallow and formed large scale fault-block trap groups of Neogene Minhuazheng formation (N1m).

Chief features enrichment mechanism of hydrocarbon accumulation in the Yellow River Mouth depression include three sectors: late-stage rapid hydrocarbon generation of source rocks of E2S3 formation, high permeability and effective porosity of rock in shallow water delta, and large scale traps of N1m formation according to Neotectonic movement. The coincidence of neotectonic movement since Neogene and the peak hydrocarbon generations in the depression has created the excellent basis for the formation of the high quality shallow-water deltaic facies offshore Bohai Bay Basin. In future, the shallow water deltaic reservoirs should be the focus targets for exploration in the offshore Bohai Bay Basin.