Oil-Gas Prospects of the Sedimentary Cover of the Dnieper-Donets Depression in Connection with New Data on the Structural Geology of the Basement

V. M. Belanov, I. M. Etingof, V. D. Kharitonov, V. F. Volkova, V. F. Indutnyy

(Geologicheskiy Zhurnal, v. 37, no. 2, p. 63–71, 1977)

The fault-block structure of the basement of the Dnieper-Donets has been studied using magnetic and gravity surveys in combination with drilling. Two main fault systems have been found: diagonal consisting of faults of northwest and northeast trend, and orthogonal, consisting of faults of north-south and east-west trend. These fault systems were used to regionalize the basement. See Fig. 1.

The northwest part of the Dnieper-Donets depression is a single mega-block, the Ingulo-Pesnyan. This feature is in turn divided into eastern and western parts by the Znamensko-Piryatin deep fault. The basement in the western part is less subsided; depth to basement is up to 6 km. In the eastern part the basement is up to 10 km deep. Several systems of blocks are recognized within this mega-block.

The Srednedneprov and Azovo-Vorsklyan mega-blocks are also cut into systems of blocks.

Although Fig. 1 shows only lines for the faults, in the basement, the fields associated with them occur in zones that have felt the influence of these faults. The question of the nature of this influence and the mechanism of formation of the structures of the sedimentary cover with respect to movements along the faults requires special study. The horizontal thickness of the deep basement faults’ in the adjacent Ukrainian shield reaches several kilometers.

There is a spatial coincidence of fields of the sedimentary cover with structures of the basement. In addition to relationship to faults, such structures are also observed associated with blocks of the basement composed of more granitized material.

On a basis of these studies of the block faulting in the basement, sectors favorable for oil-gas exploration in the sedimentary cover have been designated. Fig. 1 shows 30 such areas.

Copyright © 2014 Petroleum Geology: A digest of Russian literature on Petroleum Geology