Geophysical Research Abstracts, Vol. 9, 01387, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-01387

Cretaceous-Cenozoic tectonic evolution of Odessa Shelf from seismic data (Ukrainian Black Sea)

S. Stovba (1), O. Khriachtchevskaia (1), R. Stephenson (2)

(1) "Naukanaftogaz" - Scientific Research Institute of Oil and Gas Industry of National Joint-Stock Company "Naftogaz of Ukraine", Ukraine, (2) Netherlands Resarch Centre for Solid Earth Sciences, Vrije Universiteit, Netherlands (hryaschevska@nng.kiev.ua / Fax: +38 044 5852765)

Three main stages of the Cretaceous to Cenozoic tectonic evolution of Odessa Shelf (northern margin of the Black Sea) have been inferred from the interpretation of more than 10000 km regional seismic data. (1) Initial rifting began in the Early Cretaceous and continued until the Santonian (˜112 -83 Ma). The rift event resulted in a system of half grabens with mainly south-dipping normal faults. The most significant faulting, accompanied by volcanic activity, occurred in the NE-SW oriented Karkinit-Gubkin rift, which lies between the East-European and Scythian platforms. Syn-rift deposits occur only in the dipping segments of half grabens, with uplifted segments exposed above sea level and eroded. The configuration of structures implies that they were caused by extensional stresses oriented N-S. (2) Post-rift thermal subsidence lasted from the Campanian until the end of Middle Eocene (83-38.6 Ma). A single basinal depocentre developed in the Karkinit-Gubkin area during this time. (3) The third and final tectonic stage of development of the Odessa Shelf was characterised by basin inversion related to compressional pulses taking place at the end of the Middle Eocene, in the Late Eocene, the Early Miocene and the Middle Miocene (˜38.6 Ma, ˜35.4 Ma, ˜16.3 Ma, ˜10.4 Ma). Local uplift within the Odessa Shelf, reactivation of faults and formation of inversion structures occurred at these times. The most extensive deformations were in the area of the present-day Gubkin Swell. A considerable part of the sedimentary sequence (up to the upper part of Late Cretaceous) was eroded in this area during this time. Similar inversion structures developed at the same time within the Romanian offshore part of the Black Sea. These compressional events occurred simultaneously with on-going post-rift thermal subsidence. This research was done in

the framework of the Ukrainian scientific project of NAK “Naftogaz of Ukraine” and the international MEBE project.