3D SEISMIC INTERPRETATION AND MODEL OF THE SCHRATTENBERG FAULT SYSTEM IN THE VALTICE AREA

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Abstract

The Schrattenberg normal fault system represents a dominant feature of the western margin of the Vienna Basin. Along with the Steinberg fault, they controlled the sedimentary and tectonic development of the area, and considerably participated in the deposition of the basin fill during a relatively short period of time in the Miocene. A detailed interpretation of the fault system is essential for full understanding of the local basin development and its geological architecture. The oil exploration industry targets mainly the Steinberg and Schrattenberg fault system because of the occurrences of oil and natural gas deposits that are related to the basin tectonics, which forms structural traps sealed by the main fault systems or by minor synthetic or antithetic faults.

The thesis presents a geological framework of the Mistelbach block near Valtice at the western margin of the Vienna Basin. Geological interpretation includes also the fault framework modeling with the emphasis on the course of the Schrattenberg fault system. The model was built in the Petrel interpretation software with the use of the principles of the 3D seismic interpretation. In particular, seismic stratigraphy methods, Petrel structural modeling, and seismic attributes were applied when processing the data. The resulting framework incorporates the interpretation of the main stratigraphic horizons (Eggenburg – Sarmatian).

The outcome of the geological framework building is presented as vertical seismic cross-sections and time-maps of the Miocene stratigraphic horizons. The time-map of the top of the lithothamnium limestone horizon and an illustration of the horizon surface topography model have been presented as well.

In the thesis, I used a dataset from the Valtice area, which included a 3D seismic survey, 2D seismic profiles and a well dataset. The data were provided by courtesy of MND a.s.

Key words

Vienna Basin, Mistelbach block, Schrattenberg fault, 3D seismic interpretation, Petrel