

The Rift Sequence Stratigraphy of the Itebej Field (Pannonian Basin, Serbia)

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The exploration area of Itebej field is settled in the vicinity of the eastern edge of the Pannonian Basin (Central Paratethys). The rift sequence stratigraphy interpretation of geological, seismic and well-log data enabled separation of pre-rift, syn-rift and post-rift stages which lead to better understanding of the petroleum system elements in the south of the Neogene Srpska Crnja Depression (Makó Depression in Hungary, Tomnatec Depression in Romania). The analysis included interpretation of three 3D seismic sections and well data of 33 deep wells.

Pre-rift stage is represented by deep-water Late Cretaceous turbidites and Late Jurassic ophiolites (ophiolitic mélange) of the Eastern Vardar Zone. The boundary between the syn-rift depositional sequence and pre-rift stage is marked by unconformity at the bottom of Miocene sediments. The rift initiation system tract was confirmed by several wells which drilled coarse siliciclastic sediments of the Early Badenian age. During the Middle Miocene after the early syn-rift stage, a “wide-rift” stage (Tari et al., 1999) marked by marine transgression began. All wells at the Itebej structure drilled through the rift climax system tract sediments which include reef limestones, sandy limestones (rarely) and coarse carbonate sandstones deposited during the Early Badenian Age. Above these shallow marine sediments, the Early Badenian pelagic deeper-water sediments with marls, sandy marls and marly limestones were deposited. The immediate post-rift system tract sediments represented by the Lake Pannon deep-water hemipelagic marls were deposited during the Pannonian sensu lato.

The hemipelagic marls deposited in the Srpska Crnja Depression are the main source rock for Itebej field, while the source rock potential of the Badenian sediments is significantly lower. The reservoir rocks of the Itebej structure are syn-rift reef complex sediments and pre-rift deep-water turbidites. The syn-rift carbonate reservoir rocks have high-quality petrophysical properties with commercial quantities of heavy to heavy medium paraffin-base crude oil. The seal rock are deep-water syn-rift pelagic sediments and hemipelagic post-rift marls of the Lake Pannon.

Keywords: Central Paratethys, Itebej field, rift sequence stratigraphy, reef sediments, petroleum system

References

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