AP37

Albian-Turonian Carbonate Ramp and Platform Evolution in the Al Shaheen Field, Offshore Qatar

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SUMMARY

In offshore Qatar two sedimentary systems are distinguished in the Albian to Turonian interval. The stratigraphically older one comprises a low angle mixed marl/carbonate ramp system, corresponding to the Nahr Umr Formation and the lower part of the Mauddud Formation developed during the Albian. This ramp system is overlain by a carbonate platform to intrashelf basin system, corresponding to the upper part of the Mauddud and the Khatiyah Formations, of Cenomanian-Turonian age.

The geometry and facies of the two systems are presented using data from core, thin sections, 3D seismic and age dating.

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In the Al Shaheen field the geometry and facies of the two systems have been constrained by 3-D seismic and the study of cores and thin sections. The Mauddud and Khatiyah formations have significantly different sedimentary characteristics and facies, and have been differently affected by tectonics. The Mauddud Formation is dominated by packstone and grainstone with a rudistic platform barrier, and a topographic relief expressed in seismically resolvable clinoforms. Deposition in the Mauddud is influenced by antecedent topography and synsedimentary differential subsidence, leading to more accommodation in the South. The Khatiyah facies is mud-dominated, has marly interbeds, and has a more layer-cake architecture. Synsedimentary tectonic uplift became increasingly important during the Cenomanian – Turonian, eventually leading to significant erosion of the Khatiyah in the northern part of the Al Shaheen field.

Well correlation and seismic point at stratigraphic hiatuses between the Lower and Upper Mauddud and between the Khatiyah and the overlying Laffan Formation. The extent of the stratigraphic gaps and the correlation of the Middle – Upper Cretaceous formations offshore Qatar with age-equivalent sequences elsewhere in the Middle East is under investigation.