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The Arab D – Hanifa Reservoir Communication: Stratigraphic Solutions to Engineering Problems

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ABSTRACT

Anomalies in production and numerical modeling data have been observed in the Arab-D and Hanifa, the principal producing reservoirs in Khurais Field. These anomalies, coupled with pressure data, indicate spatially confined communication between Arab-D and Hanifa. This study used sedimentologic and micropaleontologic analysis of 36 cored wells in the field to construct a sequence stratigraphic framework that interprets the Arab-D Member, Jubaila Formation and Hanifa Formation as three third-order sequences, each divided into several fourth- order sequences that are further divided into many parasequence sets and parasequences thereof. A revision to the Oxfordian and Kimmeridgian-aged maximum flooding surfaces is also presented based on results from this study. These three formations have been classified into different lithofacies used to propose a new depositional model that takes in context the evolution of the Jurassic carbonate platform of the Arabian plate. Integrating core data with outcrop, seismic and production data yielded correlation models that discern the geometric relationships among the three formations, as well as within them, and concludes that a considerable section of the Hanifa Formation was provincially eroded.