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AP03

Keynote - Sequence Stratigraphy & Depositional Systems in the Albian-Turonian of the Arabian Plate; Implications for Regional Exploration and Reservoir Description

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SUMMARY

The Albian to Turonian succession on the Arabian Plate shows marked spatial and temporal variation in depositional characteristics that have (a) led to a confusing lithostratigraphic nomenclature, (b) reflect its sequence stratigraphic organisation, and (c) have important ramifications for the exploitation of discovered hydrocarbons and the discovery of further reserves. It is bounded top and bottom by tectonically-enhanced, platform-wide unconformities (K90 SB and K150 SB of Sharland et al. 2001, 2004). Between these major unconformities, the succession shows important large-scale cyclicity that can be related to eustatic sea-level changes (see Simmons et al. abstract). Overall the proportion of siliciciclastic input decreased with time whilst carbonates became more widespread.

Immediately above the basal K90 SB unconformity, in proximal areas coarse-grained braid plain deposits characterise the Albian to Turonian succession. In complete contrast, the only record of siliciclastics in the most distal settings may be of slightly argillaceous and dense carbonates or clay infills to karst although both still exert significant influence over reservoir compartmentilisation and connectivity. Intermediate types of siliciclastics comprise major reservoir facies, and key regional and intra-formational seals. Carbonates range from low-energy platform-top mudstones to wackestones, rudist bioherms and storm-reworked rudstones forming variable and complex reservoir facies, to relatively deepwater carbonates. Intermediate mixed facies include areas of major source rock deposition in restricted intra-shelf basins. All depositional components can be fitted within a regional sequence stratigraphic framework that predicts further exploration potential as well as forecasting primary controls on reservoir layering and compartmentalisation. The regional asymmetry of depositional systems is a major control over prospectivity at the regional scale and, for the major fields at least, is predicted to impact reservoir architecture at the field scale.