AP17

Field-scale Heterogeneity of Carbonate Reservoirs from the Arab Fm – Lessons Learned from Seven Case Studies

B.P.R Caline* (Total E&P France), C. Maza (Total E&P France), A. Roumagnac (Total E&P France), E. Zuckmeyer (Total ABK UAE) & M. Rousseau (Total E&P France)

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15061 Field-scale heterogeneity of carbonate reservoirs from the Arab Formation: Lessons learned from seven case studies

Bruno Caline (Total <bruno.caline@total.com>), Mathieu Rousseau (Total), Carine Maza (Total),
Alain Roumagnac (Total), Solange Cantaloube (Total) and Eric Zuckmeyer (Total)

Preparation of robust reservoir model for the Arab Formation relies on a thorough characterization of the different carbonate facies from core and thin-section examination. However, the key step remains to properly extrapolate the detailed facies recognition in cored wells to uncored wells. The objective of this presentation is to illustrate how electrofacies have been successfully first calibrated on a few cored wells and then extrapolated to all uncored wells in five hydrocarbon fields in the United Arab Emirates (UAE) and two in Qatar.

The sedimentary interpretation of the Arab reservoirs from the different studied fields is primarily based on the integration of: (1) high-resolution stratigraphic architecture of the carbonate-evaporite series allowing subdivision of the reservoir interval into meter-scale stratigraphic units; and (2) recognition of depositional and diagenetic trends within each stratigraphic unit in order to constrain the distribution of the main facies.

Special attention was paid to properly define a number of pre-rock types along selected cored wells, each of them being characterised by a specific log signature and porosity/permeability relationship. Once this calibration exercise was carried out, the pre-rock types were propagated to uncored wells. The robustness of the propagation needs to be validated by few blind tests on cored wells that were not used in the calibration step. This method proved to be successful in recognizing the main reservoir facies including grain-supported facies affected by tar mat deposition.

Maps for each stratigraphic unit were prepared to display the thickness and proportion of electrofacies on a well-by-well basis. These maps were used to constrain the field-scale distribution of reservoir facies taking into account the depositional and diagenetic trends provided by regional paleogeographical reconstructions. Results from the seven field case studies will be highlighted during the presentation.