Oil Rim Development under an Exploited and Cycled Gas Cap – Optimization through 2G&R Integrated Stochastic Workflow

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Optimizing the development of condensate gas fields has always been very challenging. The field presented in this paper is a horst structure located in the Euphrates graben of Syria, and is characterized by an oil rim underlying a rich and important gas-cap.

This gas-cap has been developed several years ago while the oil rim still remains unexploited. Hydrocarbon transfers have been evidenced between the oil rim and the gas-cap regions. This has proven the interest for a refined geological model, able to accurately describe the transition zone between the gas and the relatively thin oil rim (around 60 vm initially) in order to predict the evolution of fluid transfers.

An integrated subsurface study has thus been performed. The structural and geological complexity of the field (object modeling of fluviatil channels) has been handled through stochastic modeling. Advanced fluid thermodynamics and compositional simulations were used to handle the critical aspects of the fluid column. The impact of the main uncertainties have then been assessed in order to identify and quantify possible solutions for the development of the oil rim, together with a risk assesment providing the necessary data for management decision.

At stake is to optimize a strategy which requires a compromize between the different companies involved, since their interest lays in the production maximization of either the gas-cap or the oil rim, depending on whether their contract relates to dry gas or to liquid hydrocarbons production.

The originality of the method was to actually provide with different geological and reservoir models, with a final objective of ensuring the robustness of all possible developments over all these models, encompassing a wide range of uncertainty.