An Integrated Approach to Thin-Bedded Reservoir Evaluation and Modeling, Block 7, Mexico

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ABSTRACT

It is common for thin-bedded, deepwater reservoir intervals to exist below typical wireline and LWD tool vertical resolution and therefore present a variety of petrophysical and reservoir modelling challenges. Integration of petrophysical, sedimentological, and engineering data is necessary to ensure accurate identification and quantification of these reservoir quality sediments. Talos Energy's extensive Zama appraisal program collected data that allow for a fully integrated and unique analysis of thin-bedded intervals. This study incorporates data from three appraisal boreholes including 431 meters of conventional whole core, two DSTs with advanced flow monitoring technology, and an advanced suite of wireline logging tools.

Core Laboratories analyzed conventional whole core from two wells utilizing LamCount™ analysis. This analysis is designed to provide centimeter scale resolution for identification of thin beds in whole cores and improves quantitative estimation of reservoir quality and presence in Zama. Subsequently, Talos developed a modified petrophysical model utilizing NMR, QuantaGeo image logs, and high resolution conventional wireline tools. This hybrid model was applied to better quantify the areas in the depositional facies more prone to thin beds. Moreover, the model was compared to DST data from Metrol's advanced flow monitoring technology. The approach improved quantification of individual bed contribution and subsequently identified which perforated intervals contributed to flow. When compared to conventional analysis from wireline logging tools, this model yielded a significant increase in net reservoir thickness estimates.

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