

Hickory Field: Integrated Technologies Revitalize a Subsalt Prospect

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The integration of improved seismic technologies and new geologic structural and stratigraphic models can often revitalize a prospect. This is a case history of the Hickory subsalt prospect in offshore Louisiana where 3-D raytrace modeling, new geologic structural and depositional models, and improved seismic processing techniques were employed. They developed a prospect which when drilled became Hickory Field.

In 1994, Anadarko and Phillips drilled Teak Prospect, which was a non-commercial subsalt discovery in South Timbalier Block 260. Initial mapping showed the Hickory Prospect in Grand Isle Block 116 to be a synclinally-separated look-alike with little potential for better sand development.

Improvements in seismic imaging, notably a 3-D prestack depth migration, allowed the base of salt to be

accurately re-interpreted and showed the local minibasin to be open to the northeast, toward potential sand sources. A new depositional model was developed in which deep-water turbidite sands were transported into the basin from the northeast, making Hickory Prospect potentially more sand-prone. Empirical models supported the likelihood of increased sand presence as compared to the Teak area.

The improved seismic imaging also revealed several amplitude anomalies. A raytrace modeling study was undertaken to better understand these amplitude anomalies and thus reduce exploration risk. Comparing modeled results to the existing 3-D prestack depth-migrated seismic dataset enabled us to high-grade the initial location and make the exploratory well a success.