Revitalizing an Old Field—Main Pass 73—Gulf of Mexico Shelf

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EXTENDED ABSTRACT

Introduction

The Gulf of Mexico shelf has been a prolific oil and gas production region for over seventy years. With limited ability to acquire new seismic streamer data due to dense spacing of surface platforms, seismic data used for interpretation and prospect generation has been in many cases sub-optimal.

Many of the producing fields in the Gulf of Mexico shelf consists of steeply dipping hydrocarbon bearing sands truncated against salt domes. Unfortunately, in many cases the salt bodies defining the reservoir edges are not well imaged on associated seismic data, making the accurate mapping of the producing reservoir very difficult.

In the past few years, efforts have taken place to acquire new data on the Gulf of Mexico shelf. The newer data is mainly acquired using ocean bottom node technology which results with wide azimuth seismic data. The new data has the potential to have much better seismic resolution than the older narrow azimuth streamer data used by the industry for many years. In addition, nodes can be placed much closer to surface installations, creating better illumination in these areas.

In parallel to the development and deployment of new acquisition technology, much progress has been made in the past several years in processing and imaging technology. The main advancements include (a) the ability to construct more detailed anisotropic earth models with much more complex salt bodies and (b) the use of more accurate depth migration algorithms.

In general, processing and imaging results will only be as good as the quality of the input seismic data and the velocity model. However, the use of more accurate models and depth imaging algorithms can result in much more reliable data, even when we are limited to the use of older seismic data.

The case study presented in this paper demonstrates how the use of improved model building and depth imaging technology has led to a change in the interpretation of the salt model for the Main Pass 73 (MP73) Field. A drilling program targeting the Lower Pliocene and Upper Miocene sands resulted in significant new discoveries of updip oil and gas reservoirs, thus giving new life to an old producing field.

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