

**DETERMINING STRATIGRAPHIC VARIATIONS FROM THREE-DIMENSIONAL SEISMIC AND WELL DATA:
LISBURNE FIELD, ALASKA**

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Prior to development of the Lisburne oil field on the Alaskan North Slope, Standard Oil shoot a three-dimensional seismic survey over its Lisburne acreage. The initial use of this data was in reservoir delineation. In addition, since field startup in 1986, an integrated geology and geophysics analysis of these data has proven useful in aiding field development planning.

Interpretation of the three-dimensional survey included tracking key horizons on an interactive work station and generating time and amplitude maps for these horizons. Amplitude maps possessed considerable information content.

In particular, the amplitude of the reflection from the Lower Cretaceous unconformity, where it truncates the Lisburne carbonate section, shows distinct areal variations related to the acoustic properties of the unit being truncated. This permits observation of stratigraphic variations in the Lisburne that are difficult to infer from intra-Lisburne reflections alone.

To interpret these amplitude data, a number of geologic cross sections were generated based on well data, well-to-well correlations, and concepts of possible stratigraphic variations between wells. The seismic response of these models was calculated by computer and the results compared with the actual seismic data. As a result, a stratigraphic trend was identified in a subzone of the Lisburne that was not apparent from well data alone. This trend is attributed to an interval of enhanced porosity and has been corroborated by recent drilling. Thus, the three-dimensional survey, in combination with data from development wells, continues to make an ongoing contribution to understanding the field and to development planning, demonstrating the importance of development geophysics and a combined geosciences approach to field development.

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