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A new
study for
2004

**STRATIGRAPHIC
TRAPS**

A new
treatise
drawing on
worldwide
analogs of
'Strat Trap'
fields.

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The objective:
to reduce
exploration risk.

EXPLORATION FOR STRATIGRAPHIC/SUBTLE TRAPS

Closure in stratigraphic traps is created by stratigraphic, lithologic or hydrodynamic variations rather than by folding and faulting. Most stratigraphic traps are subtle, in that detection is problematical and lateral closure is difficult to prove. Stratigraphic trapping mechanisms may combine with open structural noses and small anticlinal closures to produce subtle combination traps, which are also difficult to detect and evaluate. Most large stratigraphic/subtle traps were discovered either by accident or through geologic reasoning that proved to be incorrect. Explorationists have made limited efforts to deliberately search for stratigraphic/subtle traps because it is relatively easy to find structural traps with present-day tools and ideas, and the concept for structural plays is more acceptable to management.

Historically, more than 80% of the stratigraphic/subtle traps discovered to date are found in North America, which surely reflects the fact that much more drilling has taken place in North America than elsewhere. The rest of the world has been looking for structural traps and must eventually begin to uncover the numerous fields in stratigraphic/subtle traps that will probably contain a large proportion of future reserve replacement. These traps, which represent one of the last domains of hydrocarbon exploration, will pose significant challenges for geologists and geophysicists.

The Stratigraphic/Subtle Traps E&P Treatise presents systematic analyses and comparisons of existing fields with a view toward gaining a better understanding of the geologic processes responsible for the creation of stratigraphic/subtle traps and the timing of trap formation relative to hydrocarbon charge at the prospect scale. This improved geologic understanding, together with recent advances in seismic modeling and attribute analysis, better data acquisition and processing, and sequence stratigraphic concepts, will lead to reduced exploration risk.

Most basins contain the basic requirements for the creation of stratigraphic/subtle traps. These requirements include depositional and diagenetic changes, unconformities with resulting truncated beds, buried erosional or constructive surfaces, and variations in reservoir fluids. Foreland, intracratonic, passive margin and rift basins are the most common settings for the development of stratigraphic/subtle traps. Because of constant recurrence of the same depositional and diagenetic processes and tectonic movements that produce stratigraphic/subtle traps, petroleum basins throughout the world probably contain many more of these traps than have been discovered so far.

Hidden trends and features may occur in association with unconformities, at undrilled depths in productive trends, and in relatively unexplored regions. Although seismic control and interpretation can assist in locating such trends and features, geophysics is not the full answer. Successful identification and delineation of stratigraphic/subtle traps require the integration of a wide variety of exploration techniques with knowledge of analog fields and detailed study of stratigraphy, paleogeomorphology, paleogeography, paleostructure, paleontology and palynology. Analog fields are particularly useful for the implementation of new technology by highlighting and illustrating how a play concept exhibits itself within the available data.

The E&P Treatise on Exploration for Stratigraphic/Subtle Traps is now available digitally on CD-ROM and in Web-deliverable format.

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