Managing Exploration Risk: Learning from the Past, Applied to the Future

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An efficient exploration process incorporates an understanding of how data and technology evolve through the exploration cycle of a basin and tailors strategies to exploit both incremental and breakthrough learning. A study of worldwide basins reveals common patterns of play type evolution that are linked to phases of data and technology acquisition.

This analysis itemizes factors found to impede new play generation and advocates an exploration process that maximizes the use of sequential data acquisition. Examples of both evolutionary and revolutionary exploration applications are cited from the Gulf of Mexico and Angola basins. Three factors were found to retard the quick recognition and capitalization of new basin plays: (1) insufficient seismic quantity and/or quality to enable the use of direct hydrocarbon indicator techniques; (2) prevailing geologic models for "non-bright" plays that infer an unattractive resource base and/or unacceptably high risk; and (3) unavailability of a specific technology needed to reduce play risks, or costs, to acceptable levels.

Individual strategies used to minimize these obstacles to basin development can be summarized into a four-phase exploration process: (1) timely acquisition of appropriate seismic data; (2) achieving geographic expertise; (3) understanding causal mechanisms of pay distributions; and (4) defining and filling key technical gaps.

This paper suggests an exploration process that seeks to overcome obstacles to new play generation by tailoring basin strategies to successive phases of data availability.