

Commercial Aspects of Gas Hydrate Exploration

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ABSTRACT

Drilling results from Japan and the Canadian Arctic have demonstrated the potential for production of natural gas from gas hydrate. Commercial gas hydrate production is feasible within less than 10 years provided that several critical business issues can be addressed. These include the total volume of natural gas that can be recovered from each well, the rates of production, operating expense, and projected gas prices.

Exploring for gas hydrate prospects requires the same considerations of a petroleum system as for conventional prospecting. In addition, political and economic factors cannot be ignored. As such, the Canadian and U.S. Arctic, and the U.S. Gulf of Mexico are the prime North American locations for hydrate exploration.

A number of factors make the Gulf of Mexico an area of interest. First, gas hydrate reaches its maximum concentration in coarse clastics, and deposition in the Gulf provides for substantial amounts of sand within the zone of hydrate stability. Second, the gas flux rate of the Gulf of Mexico is among the highest in the world and the Gulf's extensive system of migration paths have the potential to fill many reservoirs with gas hydrate in the hydrate stability zone. Third, the existing infrastructure of platforms and pipelines improves the economics of hydrate development through the leveraging of existing facilities. Fourth, there is little political opposition to developing hydrate resources in the Gulf of Mexico.

Few wells have been adequately logged through the hydrate stability zone in the Gulf. As a result, published models are presently derived mainly from piston core data and observations from submersibles. These models tend to omit the potential for more deeply buried hydrate concentrations. Integrating a more stratigraphic approach of the Gulf into subsurface models yields a wealth of new exploration opportunities for offshore operators.