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New Technology Needs for Methane Hydrates Production

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Abstract

According to the recently signed Energy Bill, the total estimated US gas hydrates is 2000 trillion cubic feet. More importantly, this may be as much as one fourth of the worlds hydrate deposits. Add to these central facts the realization that both conventional and unconventional natural gas supplies will likely diminish as early as 2020, and you have a strong case to research ways to obtain this natural resource.*

Methane Hydrates are a unique and challenging energy resource. Unlike conventional oil and gas deposits, Methane Hydrates will require an innovative technology package that can manage the dynamics of this resource safely and efficiently. The technology employed must control the methane hydrate resource throughout the exploration and production process.

The most important issue when considering drilling into and producing from a methane hydrates reservoir is the fact that this is an unstable resource both in sub sea deposits and in an onshore reservoir. Methane will freely liberate itself from its water encasement as it is produced to the surface. Management of the reservoir and the entire drilling and production process to prevent depression or any type of environment changing subsidence, and preventing any of the hydrate from escaping a sub sea production process and causing installation safety issues are all key to the development of this new technology.

The authors will explore the technologies and processes necessary for the drilling and production of Methane Hydrates. What types of technologies exist today, what emerging technologies can be used, and what technologies are there yet to be developed to complete the entire drilling and production system. Will these technologies and tools make this a practical process for the industry? Why conventional drilling equipment and underbalanced drilling processes, while feasible and in the case of underbalanced, developing a broader application range, are not practical and safe for the production of Methane Hydrates. Why the apparatus and methods of Managed Pressure Drilling, while still very new to the industry, could be the process that allows us to safely and efficiently produce this immense resource.

Introduction

Methane Hydrates are receiving more attention in the oil and gas industry as a potential new resource. This attention ranges from government funded research to major operators beginning to drill for core samples of the Methane Hydrate deposits. To date there has been very little drilling into these deposits, and no experience in intentional production. The current administration of the U.S. government has indicated the Department of Energy will receive additional funding for research initiatives to devise methods to tap the massive energy potential for actual Methane Hydrate production. There are many proven processes to produce oil from reservoirs. Each of these has