Low Environmental Risk and Technology Options to Enable Commercial Development of Natural Gas Hydrate

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ABSTRACT

Commercial natural gas hydrate (NGH) represents a vast potential energy resource, with a conservative estimate of Gulf of Mexico resource potential calculated as 6717 trillion cubic feet of gas in place in sand reservoirs. Production should commence within a few years in Japanese waters and will likely be followed by India and other Asian countries now importing large amounts of natural gas. A limiting factor for commercial development of NGH has been the costs calculated using existing conventional drilling and production technology. NGH offers new exploration and production options. NGH deposits are located within consolidated sediments, no deeper than about the uppermost kilometer beneath the seafloor. NGH is stable as a solid material at formation conditions, and we believe that innovative drilling and seafloor operations technologies for NGH development will allow safe development of NGH at a fraction of the conventional cost. By taking advantage of NGH attributes, this approach has the potential to make NGH in the Gulf of Mexico competitive with other natural gas resources. NGH characteristics have inherent safety and environmental aspects that allow new technological approaches to be undertaken. An important aspect of NGH is that it is stable at ambient reservoir conditions and is typically contains almost pure methane, with no associated oil. For production, NGH must be converted from its solid form to its constituent gas and water and depressurization will probably be the most widely used. With proper NGH conversion practices, there is no danger of blowout, and the environmental risk of NGH exploration and production is thus extremely low.

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