Mobil's Floating LNG Plant

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ABSTRACT

Mobil Oil has recently developed a floating LNG plant design. The world-scale generic plant will be placed on a 165 meter square by 42 meter deep concrete barge with a moon pool in the center. It is designed to produce 6 million tons per annum (MMTA) of Liquefied Natural Gas (LNG) with up to 55,000 bbls/day of condensate from 1 BCFD of gas. All produced products (LNG and condensate) are stored within the barge and periodically transferred to shuttle tankers for transport to market.

KEY WORDS: concrete barge, condensate, floating production, LNG, offloading systems, process equipment, safety

1.0 INTRODUCTION

Floating LNG offers significant potential cost savings relative to onshore plants due to the elimination of harbor facilities, separate offshore field processing facilities, and the field-to-shore pipelines. The construction may be faster with the potential for worldwide sourcing of modular components than can be linked together in a protected port. The plant can be commissioned in transit. From an extensive review Mobil has concluded that a floating LNG plant, as shown in Fig. 1, is technically feasible, economical, safe, and reliable. It was also determined that, compared to conventional grassroots LNG developments, there is the potential for 25% + capital savings over an onshore plant development.

The initial design philosophy applied to the Mobil floating LNG plant was to provide both a generic hull and topsides which would fit most of the gas fields in the Pacific Rim. The plant would take advantage of economies of scale and could be used for all size fields. Small gas fields could be monetized from the large floating LNG plant simply by depleting them faster. The base case design, reported in this paper, assumes an offshore location in Northwest Australia where typhoons are present. The assumed water depth is 137 meters but the plant has a wide range of water depths in which it can be used. Special processing requirements, like high CO2, or extremely rough weather, such as found in the North Sea, were also studied but are not reported here. No LPG recovery or sulfur recovery is allowed. Booster compression is provided should the field pressure decline to as low as 20.7 bars. There are no drilling or workovers from the barge. Field processing will be handled on the barge and the wells will be managed from the barge.

Figure 1 – Mobil Floating LNG Concept

2.0 THE HULL

2.1 Hull Configuration

Many different hull shapes were examined to determine the optimal shape and size to accommodate all environmental conditions found in the Pacific Rim, the storm requirements and the process equipment