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## Compliance for FPSO—Gulf of Mexico and Speculative Builds

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### Abstract

Floating Production, Storage and Offloading (FPSO) facilities have developed over the last 40 years to become an increasingly popular solution worldwide for offshore field development. To date no FPSO has been deployed within the US Gulf of Mexico (GOM) where the dominant production facilities have been fixed structures and floating production system based on Spar, TLP, and Semi-submersible platforms. Higher oil prices and significant ultra-deepwater prospects extending farther beyond established pipeline infrastructure, make FPSOs an increasingly viable option. Operators, Contractors and new entrepreneurs worldwide want to capture that market and are committing to the FPSO solution by placing orders for speculative builds. Many of these build contracts are signed without a specific field destination or production contract in hand and are contracted with a “generic” FPSO specification. The design specification of a generic FPSO presents many challenges. Selecting a workable environmental design envelope and the type of regulatory environment the vessel should satisfy are some of the early decisions that will determine the success of the investment. This paper discusses the challenges of developing a speculative build in view of regulatory requirements worldwide and in the US GOM.

### FPSO background and practices

Floating Production, Storage and Offloading units (FPSO) have developed over the last 40 years to become an increasingly popular solution for development of new offshore fields. They have practical advantages compared to more traditional types of offshore installations. In addition to being one of the very few feasible technical solutions for the deep and ultra-deep water remote locations, they represent a comparatively low capital expenditure. They can to a large extent, be built based on conventional shipbuilding technology and finished and commissioned at the yard avoiding costly offshore work. FPSO units can take heavy payloads as well as

providing storage and offloading facilities. Further advantages include easy offshore installation, decommissioning and re-use.

The first FPSO was taken into use offshore Spain in 1977. Over the next ten years the FPSO established itself as a viable solution for offshore production and from a modest 12 units in 1985 the total fleet of offshore ship-shaped units (FPSO/FSO) increased to almost 200 units some 20 years later<sup>1</sup>. At the end of 2006 about 60% of the fleet is comprised of units that can produce, store and offload (FPSO) with the remainder having storage and offloading capacity only (FSO). Almost two-thirds of today's FPSO fleet is made up of tankers converted for production and storage service as shown in Table 1.

More significant to the offshore industry is the remarkable expansion of the FPSO fleet in the last ten years as shown by the solid line in Figure 1. The expansion is characterized by two distinct cycles. The first in the mid to late 1990's when new contracting strategies resulted in floating production vessels being introduced in large scale to the North Sea. The second cycle started in the early 2000's following large deepwater discoveries in areas generally remote from existing pipeline infrastructure and suitable for wet tree development. Also shown in that figure is the annual average world crude price. While the first cycle took place against a more volatile crude price environment the second cycle is benefiting from the new crude price threshold of \$50 plus and the rapid economic growth in some large economies. Based on the number of FPSO units on order and forecast this second cycle is expected to be longer and stronger than the previous one. This scenario has attracted new entrepreneurs to the floating production market financed by private investors and the financial market. Many of these investments however are made on a speculative basis without a production contract in hand, i.e., a “generic” FPSO solution.

### The challenges of a FPSO speculative build

Recent higher oil prices have added to the pressure to shorten the development cycle of offshore oil and gas fields. Until recently design and build cycles for newbuild FPSO projects were in the range of 3-4 years with some 18 months for design and specification and 24 months for construction and installation. Today the project cycle has been cut down to under two years using “design one, build multiple” strategies<sup>2</sup>. This schedule compression can be achieved for multiple large developments that have similar geologic, geographic, economic, and contractual elements. While speculative builds