

FPSOs
IN THE GULF OF MEXICO:
A REVIEW OF REGULATORY OBSTACLES

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INTRODUCTION

Shallow water reserves are being depleted at an estimated 3% per annum. The worldwide deep offshore sedimentary basins covers some 55 million square kilometers of ocean floor while sedimentary basins in depths of less than 200 meters cover about 15 million square kilometers.¹ There are an estimated 8-15 billion barrels of oil in the Gulf of Mexico at depths of 200 or more meters.² The huge potential for reserves of oil to be found in the deep ocean explains the great interest in deepwater oil production. Many offshore industry interests believe that FPSOs are the most economical answer to deepwater production in a variety of situations..

Some examples of deepwater interest in the Gulf of Mexico include Shell s subsea development named MENSA in the Mississippi Canyon which set a world record for production at a depth of 5,300 feet in July 1997. Chevron U.S.A. set a world record drilling an exploratory well in August 1998 on Atwater Valley in 7,718 feet of water. Deepwater drilling continues at a high pace. In November 1999 a total of 32 deepwater rigs were drilling in the Gulf of Mexico at water depths greater than 1,000 feet (305 meters)³.

FPSO s also allow the economical exploitation of smaller fields which may produce for only a relatively short time and, for that reason, are not candidates for expensive fixed platforms.

¹Westwood and Knight, The Future Market for Floating Production Systems, London November 1998.

²Galvin, Abernathy, Auble and Little, Frontiers of The Gulf of Mexico, National Ocean Industries Assoc., 2 April 1996.

³MMS GOMR Report Offshore Information dated 4 February 2000.

Once a small field is depleted, the FPSO may be moved to another small field.

Interest in deepwater drilling in the Gulf of Mexico has also been spurred by the U.S. Congress passage of the Deep Water Royalty Relief Act of 1995. This Act provides incentives, by way of royalty relief, to explore and develop oil and natural gas in certain deep water areas of the Gulf of Mexico. Importantly, this legislation signals Congress' intention that deepwater reserves should be exploited.

While there is great interest in FPSOs for use in the Gulf of Mexico, there are currently none operating in U.S. waters. This is due primarily to regulatory obstacles.

The types of FPSOs that are in operation or under construction around the world include a wide range of designs. This variety in the form and function of FPSOs has complicated the regulatory issues. Some floating units function only as production units, others as storage and offloading, and still others incorporate all three functions. Some floating drilling units presently under construction have been designed for conversion to an FPSO after the wells have been drilled. FPSOs are also constructed with a wide range of hull forms including semi-submersibles, tanker conversions, tension leg platforms and dynamically-positioned vessels.

Production facilities on a floating unit are usually used to separate the fluids pumped from a well into the natural gas, crude oil and water. The storage aspect usually consists of storing the oil portion of the fluids obtained from a well; there has also been some discussion of liquefying the natural gas portion of the well fluids at a floating facility. The offloading aspect is the unit's capability of transferring the crude oil to a shuttle tanker for delivery ashore.

U.S. REGULATORY REGIME

Two agencies have responsibility for the regulation of drilling and production facilities on the U.S. Outer Continental Shelf (OCS) -- the U.S. Coast Guard and the Mineral Management Service (MMS). These two agencies have overlapping regulatory authority which has caused some jurisdictional problems and, in some situations, resulted in duplication of effort on the part of offshore operators.

The Coast Guard s regulatory authority is primarily derived from the U.S. Shipping Statutes⁴, the Oil Pollution Act of 1990 (OPA)⁵, the Clean Water Act⁶, the implementing legislation for MARPOL and SOLAS, and the Outer Continental Shelf Lands Act (OCSLA)⁷ . The MMS s regulatory authority is found solely in the Outer Continental Shelf Lands Act. The two agencies have dual responsibilities in certain key areas including environmental protection, safety and casualty investigation. OCSLA is applicable to the subsoil and seabed from a point three miles to two hundred miles offshore.⁸ This area is in the U.S. Exclusive Economic Zone.

Historically the Coast Guard has been the lead agency in the design, construction and operation of mobile offshore drilling units (MODUs) and the MMS the lead agency for fixed drilling and production platforms as well as the drilling systems on the mobile offshore drilling units. In general, the MMS regulates drilling and production activities including well servicing, well risers, and the design of environmental criteria, production equipment and platform

⁴ 46 U.S.C. § 2101 et. seq.

⁵ 33 U.S.C. § 2701 et. seq.

⁶ 33 U.S.C. § 1311 et. seq.

⁷ 43 U.S.C. § 1331 et. seq.

⁸See 43 U.S.C. § 1331(a)

structures. The Coast Guard regulates vessel design and construction including afloat stability, structural integrity, cargo systems, fire protection, vessel crewing requirements, bilge and ballast systems and vessel-to-vessel transfer operations.

Hybrid units, such as FPSOs and tension leg platforms, are subject to review from both agencies.

ENVIRONMENTAL IMPACT STATEMENT

At the present time, MMS has introduced a major obstacle to the use of FPSOs in the Gulf of Mexico. The MMS considers FPSO technology and shuttle tanker operations in the Gulf of Mexico as having a major impact on the environment. Consequently, the MMS ordered, in 1998, that operators submit an Environmental Impact Statement (EIS) as a requirement for any production project involving an FPSO.⁹

The offshore industry has expressed concern that the requirement of a site specific EIS for each project would greatly slow down project development and negate the advantages of using the FPSO. In these circumstances, the MMS agreed that a generic EIS could be prepared, and that an operator desiring to use a FPSO could tier off of the generic model in order to obtain a faster approval of a specific project.

In May 1999, the MMS awarded a contract to Ecology and Environment, Inc. to prepare the EIS. MMS manages the contract and retains overall responsibility for statutory compliance¹⁰. The offshore industry group DeepStar agreed to fund the study in order to reduce the time for its completion. The EIS will assess environmental effects by examining a hypothetical one million

⁹ FPSO Environmental Impact Statement: What Is Happening? George, Parker and Cranswick, OTC 10705, May 1999.

¹⁰MMS News Release dated May 3, 1999.

barrel storage capability on a FPSO. A high case scenario of 2.3 million barrel storage will also be examined. The MMS, in conjunction with DeepStar, is presently proceeding with work on the EIS, a draft of which is anticipated in the near future.

The Coast Guard declined to actively participate in the study and chose to act only in an advisory role. The Coast Guard believes that the environmental impact analyses that it has prepared previously relating to double hulls, safety regulations, lightering, certificates of financial responsibility and other environmental protection regulations are adequate, and that it has no need to conduct any further environmental studies. It is interesting to note that the areas that the MMS is studying in the EIS includes the operation of shuttle tankers and oil transfer systems areas in which the Coast Guard has the greater expertise.

The MMS sponsored a workshop on June 7-8, 2000 to assess if FPSOs are viable and acceptable options for the Gulf of Mexico and other offshore areas.¹¹ The workshop, which was also co-sponsored by the Coast Guard and Deepstar, included a discussion of the experiences in operation of FPSOs in other parts of the world. The first day of the conference included presentations by regulatory officials from Norway, United Kingdom, Australia, Canada, Brazil, New Zealand, and Mexico, as well as the major classification societies. The second day included panels of industry and governmental representatives addressing various questions relating to oil storage, offloading, crewing, evacuation, vessel motion, stability, and the advantages of vessel conversions versus new buildings.

It remains to be seen what requirements the MMS will impose on the use of FPSOs. Until the offshore operators are confident that they understand the technological and financial effects

¹¹MMS Notice to Lessees No. 2000 - NO2 dated May 9, 2000.

of standards that may be imposed as a result of the EIS, they will not propose the use of FPSOs in the Gulf of Mexico.

REGULATORY DIVISION OF AUTHORITY

The Coast Guard and the MMS have attempted to reconcile their overlapping authority so that industry does not have to satisfy two regulatory agencies for each FPSO system. Recently the two agencies announced a Memorandum of Understanding (MOU) that addresses ship-shaped FPSOs, Mobile Drilling Units and fixed platforms.¹² This replaces a 1989 agreement that only addressed MODUs and fixed platforms. Under the present MOU, the MMS is the lead agency in the review of design and construction of fixed platforms. The Coast Guard is the lead agency for FPSOs with ship-shaped hulls and MODUs. The two bureaucracies have been unable to reach an agreement as to the apportionment of responsibilities for FPSOs that have non-ship-shaped hulls.

The division of responsibility between the Coast Guard and MMS is as follows for ship-shaped floating units. The Coast Guard has responsibility for vessel design and construction, bilge and ballast systems, afloat stability, lifesaving systems, firefighting systems, crude oil washing systems, inert gas systems, workplace safety and health, vessel crewing requirements, and lightering operations. The MMS has responsibility for approving the Deepwater Operating Plan (DWOP), in-place design environmental criteria, marine risers, foundations, drilling, completion, well-servicing and workover, production equipment, and export pipelines (if applicable).

¹²Memorandum of Understanding between the United States Mineral Management Service of the Department of the Interior and the United States Coast Guard of the Department of Transportation concerning Regulation of Activities and Facilities on the Outer Continental Shelf of the United States dated 16 December 1998.

The Coast Guard and MMS have not yet agreed on which agency will take the lead on matters involving the riser turret and the turret to vessel hull interface, mooring and tethering system, and hazardous area classification.

COAST GUARD REQUIREMENTS

Coast Guard requirements include the following in respect of U.S. flag FPSOs: USCG plan review and approval; issuance of a Coast Guard Certificate of Inspection and compliance with 46 CFR Subchapter D (Tank Vessels), 46 CFR Subchapter F (Marine Engineering), 46 CFR Subchapter J (Electrical Engineering), 46 CFR Subchapter I-A (Mobile Offshore Drilling Units), 46 CFR Subchapter W (Lifesaving Appliances and Arrangements), 33 CFR Subchapter N (Outer Continental Shelf Activities), 33 CFR Part 96 (Rules for the Safe Operation of Vessels and Safety Management System), 33 CFR Part 155 (Oil or Hazardous Material Pollution Prevention Regulations for Vessels), 33 CFR Part 156.200 (Lightering Regulations), 33 CFR Part 157 (Pollution Prevention), and 33 CFR Part 159 (Marine Sanitation Devices).

In respect of pollution prevention plans for U.S. and foreign flag FPSOs, while operating on the U.S. outer continental shelf, the Coast Guard requires FPSOs to have an approved Shipboard Oil Pollution Emergency Plan (SOPEP) and Vessel Response Plan (VRP). These plans must be approved by the Office of Response (G-MOR) prior to operation. Foreign Flag FPSOs must also receive a USCG Letter of Compliance (LOC).

FPSOs must also comply with international treaties including SOLAS (Safety of Life at Sea) and MARPOL 73/78 (pollution prevention). FPSOs registered in non-signatory countries, or which fail to comply with international treaties, will be treated according to the requirements of a U.S.-flag vessel, including a full plan review for compliance with U.S. regulations and issuance of a Certificate of Inspection.

The Coast Guard also requires that FPSOs operating on the U.S. outer continental shelf be subject to U.S. citizenship employment regulations found in 33CFR 141 Subchapter N. These regulations require that U.S.-flag FPSOs must employ U.S. citizens, with no waivers or exemptions. Foreign-flag, U.S.-controlled FPSOs , must also fill all positions with U.S. citizens; however, a waiver may be granted for a limited period time. Foreign-flag, foreign-controlled FPSOs are eligible for an exemption but all requests for exemptions or waivers must be processed by G-MOC. Additional guidance to these regulations is provided by NVIC No. 7-84.

In the case of U.S.-flag FPSOs operating on a foreign outer continental shelf, and foreign-flag FPSOs operating on the U.S. outer continental shelf, compliance with both the ISM Code and the STCW Code is required. U.S.-flag FPSOs operating on the U.S. outer continental shelf are considered to be engaged in domestic voyages, and thus the STCW and ISM Codes do not apply to the crew. However, the Coast Guard does encourage voluntary compliance with the ISM Code or MMS SEMP.

VESSELS AND CARGO

The U.S. Coast Guard has determined FPSOs to be vessels¹³ for the purpose of design and construction standards. The Coast Guard has also determined that fluids removed from a well and stored on a FPSO are cargo. These classifications result in the application of U.S. tankship statutes and regulations to FPSOs including SOLAS, MARPOL and the Oil Pollution Act of 1990. It should be noted that because the Coast Guard considers an FPSO a vessel with

¹³The U.S. statutes containing vessel standards (46 U.S.C. § 2101(45)) refer to the definition of vessel at 1 U.S.C. § 3 which provides that the word vessel includes every description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water. This definition is incorporated in the Coast Guard's Outer Continental Shelf Activities regulations at 33 C.F.R. § 140.10.

cargo aboard does not necessarily mean that the U.S. courts would make the same determination in deciding disputes such as those relating to bodily injury, collision, limitation of liability, insurance, general average, salvage and sue and labor.

A significant aspect of the Coast Guard determination that an FPSO is a vessel and the oil is cargo is the application of OPA. A newly built FPSO or conversion will thus be required to have a double hull in the cargo tank area. Any existing single hull FPSOs would need to be removed from service in accordance with the phase-out schedule. Generally, single hull tank vessels of 30,000 gross tons or more, originally delivered before December 31, 1975, are no longer permitted to operate in U.S. waters. Single hull vessels delivered after 31 December 1975 may continue to operate until their 25th anniversary, except all single hull vessels must be phased out by January 1, 2015. It is anticipated that the Coast Guard will consider the conversion of a tank vessel to an FPSO as a major conversion and therefore require a double hull.¹⁴

The Coast Guard considers the transfer of crude oil from a FPSO to a shuttle tanker as a cargo lightering operation, and thus, the U.S. lightering statutes and regulations would be applicable. The Coast Guard may also require the transfer to take place in a designated lightering zone.

The Coast Guard considers a riser connection to a FPSO to be an OCS facility. This determination allows the Coast Guard to establish a 500 meter safety zone around the FPSO's perimeter. The Coast Guard could then regulate vessel traffic, including shuttle tankers, inside the safety zone. While not affecting current applications to utilize an FPSO, the Coast Guard, on 7 December 1999, published a Notice of Proposed Rule making, which would, when final,

¹⁴See Navigation and Inspection Circular 10-94 -- Phase-out Schedule for Existing Single Hull Vessels Carrying Oil in Bulk.

replace existing regulations relating to various safety equipment and procedures on offshore facilities including FPSOs.¹⁵

FLOATING OCS FACILITIES

If an FPSO does not conduct any drilling operations and does not store any oil, the unit is regulated as a floating outer continental shelf facility. Even these units must comply with vessel standards for machinery, electrical, firefighting, lifesaving, and pollution protection systems. This would include SOLAS and MARPOL standards applicable to vessels that are not tankships, as well as the pollution prevention standards of OPA and the Clean Water Act applicable to vessels other than tankships. If chemicals are used in the processing of the gas aboard a production unit, the chemicals would be considered ship stores since they are consumables used in the operation of the vessels. The storage and handling of these production chemicals would be regulated as ship stores.¹⁶

NON-U.S.-FLAG FPSOs

If a floating unit engages in drilling, it must comply with the IMO Mobile Offshore Drilling Unit (MODU) Code or the equivalent U.S. regulations.

For newly built, non-U.S. flag FPSOs operating on the U.S. Continental Shelf, the Coast Guard requires compliance with the following standards¹⁷:

- a. SOLAS 74/78 with amendments including ISM certification for tankships.
- b. MARPOL 73/78 for tankships.
- c. Classification society rules for steel vessels.

¹⁵See 64 F.R.234, pp. 68416-68505.

¹⁶See 46 CFR § 147.

¹⁷Coast Guard letters 16711 dated 30 March 1998 and 25 February 1999.

- d. Classification society rules for mobile drilling units.
- e. U.S. regulations relating to marine pollution Certificates of Financial Responsibility for both a MODU and tankship.
- f. U.S. pollution/prevention statutes/regulations relating to foreign tankships and MODUs operating in U.S. waters, including double hull tankship standards, port state control inspections and oil transfer procedures.
- g. U.S. regulations relating to foreign flag vessels carrying dangerous cargoes.

Thus, a foreign-built FPSO would be required to have a double hull, an ISM certificate, dry dock/underwater inspections at the intervals required by SOLAS for a tankship, meet the U.S. offshore lightering standards, have an USCG approved OPA Vessel Response Plan, and a flag state approved SOLAS Regulation 26 Shipboard Oil Pollution Emergency Plan. The pollution Certificate of Financial Responsibility would need to cover both tankship and MODU operating modes.

MMS REQUIREMENTS

While the standards that MMS will apply to FPSO s will not be determined until the Environmental Impact Statement is completed, it is clear that a Deep Water Operating Plan (DWOP) will be required. A DWOP is intended to provide information to the MMS utilizing a total system approach. The Deep Water Operating Plan must identify known hazards and unusual conditions at the site of the operations and describe (1) the method of development; (2) drilling system; (3) pipeline or offtake system; (4) riser system; (5) subsea control system; (6) production stream composition; (7) shut-in tubing; (8) special production situations; and (9) abandonment procedures.¹⁸

¹⁸MMS Deepwater Operators Plan Guideline.

U.S. CUSTOMS SERVICE

U.S. Cabotage statutes require that only U.S.-flag vessels may engage in domestic coastwise trade. The U.S. Customs Service has determined that drilling units secured to or submerged on the OCS are places in the United States. The transportation of goods by vessel and personnel between MODUs and the shore therefore must be conducted by U.S.-built, U.S.-owned and U.S.-documented vessels. The Customs Service rulings have been applied to artificial islands and warehouse vessels anchored on the OCS. It remains to be seen whether FPSO s will fall under the same ruling. However, operators should anticipate that shuttle tankers used to carry oil from an FPSO attached to the OCS will likely be required to be U.S.-built, U.S.-flagged and carry U.S. crews.

SAFETY CONCERNS

The U.S. has virtually no history of FPSO operation to draw upon with the exception of the Santa Ynez project. Thus the Coast Guard and the MMS will likely examine safety issues that have been identified on production platforms, MODUs and tank vessels¹⁹.

MMS accident reports for production platforms indicate that fire is the major hazard. Because natural gas is a major ingredient of the well fluids being pumped to the surface, leaks in the production system can cause explosions and fires. For example, MMS recently issued a safety alert to platform operators recommending that when gas sensor heads detect a 25% LEL

¹⁹The United States regulatory agencies only experience with an FPSO was associated with the Santa Ynez development located less than 10 miles off the California coast in the western end of the Santa Barbara Channel in 850 feet of water. The FPSO could daily treat up to 40,000 barrels of oil, 25,000 barrels of water and 40 million cubic feet of gas. The vessel could store 197,000 barrels of treated crude oil, 36,000 barrels of offspec product and 18,000 barrels of water. The oil was transported by a shuttle vessel to Los Angeles refineries. The Santa Ynez, which is no longer in operation, was provisionally treated under the same regulatory scheme that is now proposed by the Coast Guard for all FPSOs.

in the living quarters, ... operators should consider shutting down operations until they locate and eliminate the source of the gas.²⁰

Often human error is coupled with the presence of gas causing a fire during construction and repair activities. For example, MMS issued a Safety Alert when an employee cut into a drain line with an electric band saw. Gas condensate sprayed from the line and was ignited by the saw.²¹

Extinguishing fire aboard an FPSO presents some additional complexities since, if firefighting water remains in the vessel's hull, the stability of the vessel could be affected.

Weather is also a factor for facilities located in the Gulf of Mexico. Of course, hurricanes transit this area. For this reason, the MMS requires drilling and deepwater production facilities to have appropriate environmental design criteria specified in its DWOP. This information must include the weather criteria upon which the unit was designed and the operational measures to be taken under various weather conditions. Because an FPSO floats, heavy weather causes considerably more movement between the riser and the production facility than would occur with a fixed platform.

Another significant safety concern is the deepwater currents that have been discovered in the Gulf of Mexico. On 4 March 1999 the MMS issued a Safety Alert advising of subsurface currents with velocities that approached one knot at one site. The currents extended from a level of 3,000 feet beneath the ocean surface down to the sea floor.²² The MMS will require all

²⁰MMS Safety Alert Notice 174 dated 26 November 1997.

²¹MMS Safety Alert No. 188 dated May 2, 2000.

²²F.N.O. MMS Safety Alert Notice No. 180 issued March 4, 1999.

operators planning FPSOs in deepwater areas of the Gulf of Mexico to address the possible existence of these currents at a specific site and to assess the impact on the planned operations.

Personnel injuries relating to crane accidents and falls are also a serious concern. The proposed Coast Guard regulations for FPSOs require the use of personal fall arrest systems and safety nets under certain operating conditions.²³

Workplace safety is also a concern due to the presence of hydrocarbon vapors and production chemicals. The Coast Guard's proposed rules contain detailed standards regarding confined space entry, hot work and a chemical hazard communication program.²⁴

SEAMAN STATUS ON FPSOs

Whether U.S. courts will consider FPSOs as vessels and the oil stored aboard as cargo for other than regulatory purposes is not as yet known. One issue where such determinations are important in the U.S. is whether the persons working aboard these units are entitled to the benefits accorded to seamen.

Seamen are afforded the protections provided by the general maritime law and by the Jones Act.²⁵ Thus seamen are entitled to maintenance, cure and unearned wages when they become sick or injured during employment. If a seaman's injury or death is caused by negligence of the employer or fellow employees, or by the unseaworthiness of the vessel, compensation is also provided for past and future loss of income and pain and suffering.

U.S. courts have generally held that special purpose craft such as mobile drilling barges

²³See Proposed 33 C.F.R. §§ 155-165.

²⁴See Proposed Coast Guard Regulations 33 C.F.R. § 142.

²⁵See 46 U.S.C. app. § 688.

equipped with retractable legs (also called jackup rigs) and oil well work over barges are vessels for the purpose of determining a person's status as a seaman.²⁶ Fixed oil production platforms and floating drydocks have been held not to be vessels for the purpose of determining status as a seaman.²⁷ For floating units, the courts have distinguished the foregoing lines of authority by analyzing whether the structure is predominately used as a work platform or to transport equipment.

Recent cases involving floating casino barges have also addressed this issue. The courts have generally held that a casino that is indefinitely moored with no navigational crew is deemed withdrawn from navigation. As such, a casino barge is deemed a work platform and workers on board are not seamen.²⁸ Permanently moored restaurants and fish processing plants with no navigation crew aboard have also been determined not to be vessels for the purposes of determining seamen status despite the fact that the craft were registered as vessels with the Coast Guard and were capable of being moved across the water²⁹.

In these circumstances, it should be anticipated that the courts may treat free-floating FPSO's with navigation crews as vessels. However, as the distinction between fixed platforms and floating vessels becomes blurred, it is not clear where the line will be drawn.

²⁶See, e.g., Offshore Co. v. Robison, 266 F.2d (5th Cir. 1959) and Manual v. P.A.W. Drilling & Well Service, Inc., 135 F.3d 344 (5th Cir. 1998).

²⁷See, e.g. Thompson v. Crown Petroleum Corp., 418 F.2d 239 (5th Cir 1969) and Cope v. Vallette Dry Dock Co., 119 U.S. 625 (1887)

²⁸Chase v. Louisiana Riverboat Gaming Partnership, 1998 La. App. Lexis 258 (1998).

²⁹See e.g. Kathriner v. Unisea Inc., 975 f.2d 657 (9th Cir.1992)

CONCLUSION

The U.S. regulatory standards for FPSOs are in a state of on-going development. The public comment period for the Coast Guard's proposed rules closes 5 July 2000. The MMS's Draft Environmental Impact Statement is due for release in the near future. Subsequently public hearings will be held.

It remains to be seen what impact the Environmental Impact Statement will have on the future use of FPSOs in the Gulf of Mexico. However, in light of the U.S. Congress' intention to encourage deepwater oil exploitation, it would seem to be only a matter of time before the offshore industry will add FPSOs to its array of oil producing facilities.