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## Bringing Energy and Value to America

Using technology that has reached a level of complexity that rivals space exploration, the equipment used to bring oil and gas to America from offshore areas is as varied as the geography of the locations where the exploration takes place — from offshore Alaska to the North Sea to the Gulf of Mexico. Following are descriptions of the types of equipment that are used to get the job done.

### Drilling Rigs

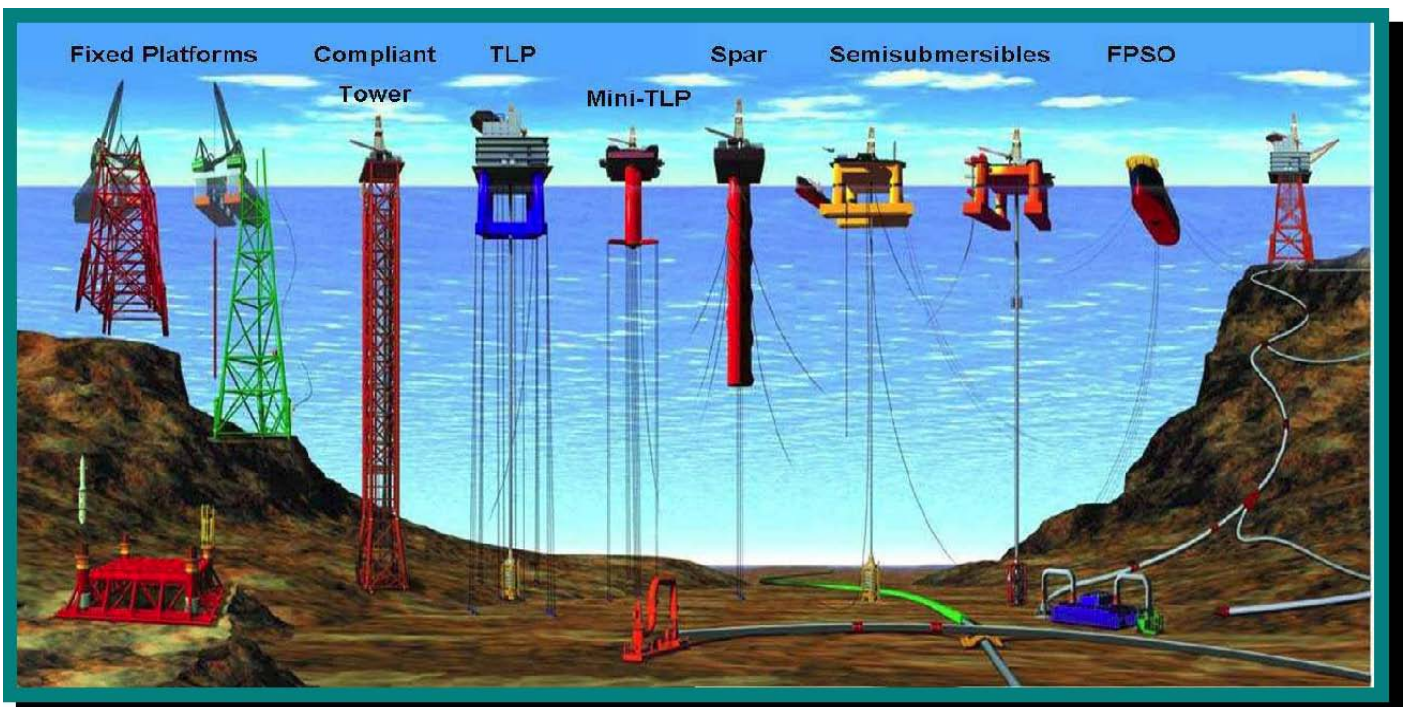
A drilling rig is mobile and moves from location to location in search of oil and gas resources. Once those resources are found, the drilling rig moves on, to be followed by a production platform. The term "Drilling Rigs" includes several types of self-contained offshore drilling facilities:


- **Jackup:** Mobile bottom-supported offshore drilling structure with columnar or open-truss legs that support a deck and hull. The legs can

be raised or lowered – independently of each other – as needed. A jack-up is towed to an offshore location and the legs are securely attached to the seafloor. The barge and drilling structure are then slowly raised above the water to a predetermined height to maintain stability in the face of high winds, waves, and currents.

A key post-Katrina modification is that the height of a jack-up has been increased to improve the level of "survivability" of the equipment in the event of the high waves that can occur during a hurricane.

- **Submersible/Semisubmersible:** Floating vessel supported on large pontoon-like structures that are submerged or partially submerged. The operating decks are elevated 100 feet or more above the pontoons on steel





columns that are partially submerged. Semisubmersibles can operate in a wide range of water depths, including deep water. They are usually anchored with eight to sixteen anchor chains, which are computer controlled to maintain position. Semisubmersibles can be used for most aspects of offshore drilling. The size of a semisubmersible can be vast, comparable to a floating skyscraper.

## Production Platforms

Floating production platforms are some of the largest and most technologically advanced offshore platforms in the world. They have the capability of processing hundreds of thousands of barrels of oil or millions of cubic feet of gas per day. Unlike drilling rigs, a production platform will remain in the same location, working until a field is depleted, whereas a drilling rig moves from location to location searching out resources.

Just one of these facilities can cost billions to develop and operate, but can produce enough energy for millions of people. They are increasing domestic production in previously difficult to reach locations while using environmentally sensitive methods.

- **Fixed Platform:** Fixed platforms have steel legs, which are “fixed” to the sea floor. A fixed platform is a traditional type of offshore equipment, replaced in recent years by tension-leg platforms and other types of platforms that function in deep water.
- **Compliant Tower:** A narrow, flexible tower with a piled foundation that can support a conventional deck for drilling and production operations. Unlike the fixed platform, the compliant tower is able to withstand large lateral forces by sustaining significant deflections, and is usually used in water depths between 1,000 and 2,000 feet.
- **Spar Platform:** Large diameter single vertical cylinder that supports a deck. A spar typically has a topside surface deck with drilling and production equipment, three types of risers (production, drilling, and export), and a hull that is moored using a taut system of six to twenty lines anchored into the seafloor. Spars are used in water depths of up to 3,000 feet, although existing technology can extend their use to the sea floor by pile-secured templates.

- **Tension Leg Platform:** Tensioned tendons provide for the use of tension leg platforms in a broad range of water depths, with limited vertical motion. Larger tension leg platforms have been successfully used in water depths approaching 4,000 feet.
- **Mini-Tension Leg Platform:** Floating mini-tension leg platforms make production of smaller deep water reserves cost-effective. They are sometimes used as a utility, satellite, or early production platform for larger deep water discoveries. The world’s first mini-tension leg platform was installed in the Gulf of Mexico in 1998.

## Floating Production, Storage Offloading System (FPSO)

An FPSO consists of a large tanker type vessel that is moored to the seafloor. FPSOs are designed to process and stow production from nearby subsea wells and to periodically offload the stored oil to a smaller shuttle tanker. The shuttle tanker transports the oil to an onshore facility for further processing. An FPSO may be suited for marginally economically feasible fields in remote deep water areas where a pipeline infrastructure does not exist. While one company has announced plans to use an FPSO in 2009, currently, there are no FPSO’s in use in the Gulf of Mexico. Over 90 are in use worldwide.

MMS manages offshore oil and gas exploration as well as renewable energy sources including wind, wave, solar, and underwater current, on 1.76 billion acres of the Outer Continental Shelf (OCS) while protecting the human, marine, and coastal environments. MMS also collects, accounts for, and disburses mineral revenues from Federal and American Indian lands.

For more information on MMS and energy exploration equipment in the OCS visit [www.mms.gov](http://www.mms.gov).