OFFSHORE INSTALLATIONS
Deepwater System Types
Scope

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- Jack-up drilling rig
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- Gravity-based structure
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- Spar platform
- Semi-submersible platform
- Drillship
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Types of offshore oil and gas structures include (from left to right), (all records from 2005 data):
1, 2 - conventional fixed platforms (deepest: Shell’s Bullwinkle in 1991 at 412 m/1,353 ft GOM);
3 - compliant tower (deepest: ChevronTexaco’s Petronius in 1998 at 534 m /1,754 ft GOM);
4, 5 - vertically moored tension leg and mini-tension leg platform (deepest: ConocoPhillips’ Magnolia in 2004
1,425 m/4,674 ft GOM);
6 -Spar (deepest: Dominion’s Devils Tower in 2004, 1,710 m/5,610 ft GOM);
7, 8 - Semi-submersibles (deepest: Shell’s NaKika in 2003, 1920 m/6,300 ft GOM);
9 - Floating production, storage, and offloading facility (deepest: 2005, 1,345 m/4,429 ft Brazil);
10 - sub-sea completion and tie-back to host facility (deepest: Shell’s Coulomb tie to NaKika 2004, 2,307 m/
7,570 ft).
Deepwater System Types
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- Fixed Platform
- Compliant Tower (CT)
- Mini-TLP
- Conventional Tension Leg Platform (TLP)
- Semi-FPS (Floating Production Facility)
- Truss Spar
- Classic Spar
- Control Buoy (CB)
- Subsea Tieback
- Subsea Manifold
- Tieback Flowline
GOM - rigs

**Deepwater System Types**

**Jackup platforms** (JP) are designed to drill wells in water depths from 5 to 120 meters (15 – 400 ft). They consist of a floating platform, usually roughly triangular, with tall steel-frame legs at each corner. The legs are raised while the jackup is moving (self-propelled or towed by a tug). When it arrives at a drilling location, the legs are lowered to the seabed then the platform is raised (jacked-up) up above any waves.

**Fixed platforms** (FP) are built on concrete and/or steel legs anchored directly onto piles driven into the seabed. They are used in water depths up to about 450 m (1500 ft). Hibernia, Canada is the world’s largest oil platform. **Gravity base structure** (GBS).

**Compliant Tower platforms** (CT) sit on tall, narrow, flexible towers built on a piled foundation on the seabed. They can move around sideways to handle ocean swell and waves. They are usually used in water depths between 300 and 600 meters (1,000 - 2,000 ft). The Petronius platform in the US Gulf of Mexico is the World’s tallest freestanding structure. It stands in 535m (1,754 ft) of water.

**Tension Leg platforms** (TLP) are floating structures held in place by vertical, tensioned tendons, typically steel tubes, connected to the sea floor. The Magnolia platform in the Gulf of Mexico is in 1,432 meters (4697 ft) deep water.

**Mini-TLP’s** are small, relatively low cost tension leg platforms.

**Spar platforms** (SPAR) are supported by a large vertical floating cylinder anchored to the seafloor. The world’s deepest spar is the Devil’s Tower, located in 1,710 meters (5,610 ft) of water in the Gulf of Mexico.
Deepwater System Types

**Semi-submersible platforms** (SSP) consist of one or more decks standing on legs supported by submerged pontoons. Semi-subs can move from place to place by tow or self-propelled. They are usually anchored to the sea floor by steel cables and chains and can also be kept from moving around during drilling operations by dynamic positioning – several computer-controlled propellers that keep the platform in position. Semi-subs can be used in depths from about 200 to 2,300 meters (600 to 7,500 ft).

**Drillships**, rather than rigs, are required for drilling in very deep water. A dynamic positioning system maintains its position over the well. The Discoverer Enterprise can drill oil wells in water depths of up to 3,000 meters (10,000 ft - almost two miles). The JOIDES Resolution is a research drillship that can gather sediment and rock samples under water nearly 5 km (about 3 miles) deep.

**Floating production systems** (FPS) are large ships anchored to the seabed. Pipes connect oil and gas wells on the sea bed to processing facilities on the ship. The Kizomba-A FPSO (floating production, storage, and offloading system), can store 2.2 million barrels (350 million liters, 94 million US gallons) of oil. Oil and/or gas is offloaded to tankers at regular intervals and shipped to an onshore facility for further processing.

**Subsea System** (SS) ranges from single subsea wells producing to a nearby platform, FPS, or TLP to multiple wells producing through a manifold and pipeline system to a distant production facility. These systems are presently used in water depths greater than 5,000 feet.
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**Total Weight Topsides:** 35,000 tons
- MSF, N. Module, S. Module,
- N. & S.Hub Modules, DSM 1 & 2,
- DES, LQ and Flareboom.

**Total Weight Substructure:** 50,000 tons
- LPT, 4 LP’s, TBT, 12 FP’s,
- TBS and TTS

4 No. LEVELLING PILES (LP’s) & 12 No. FOUNDATION PILES (FP’s)
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