OFFSHORE PLATFORMS

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An Overview

Offshore platforms are large structures designed and built to support drilling and production activities in offshore oil and gas fields. These structures are typically located in water depths ranging from 10 to 1,500 meters (33 to 4,921 feet) and are subjected to harsh environmental conditions, including strong winds, heavy waves, and corrosive saltwater.

https://youtu.be/-vJmAvqn6dU

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Construction Process

The construction of an offshore platform involves several stages. The following are some stages of the construction process:

1. Site Investigation

2. Design

3. Fabrication

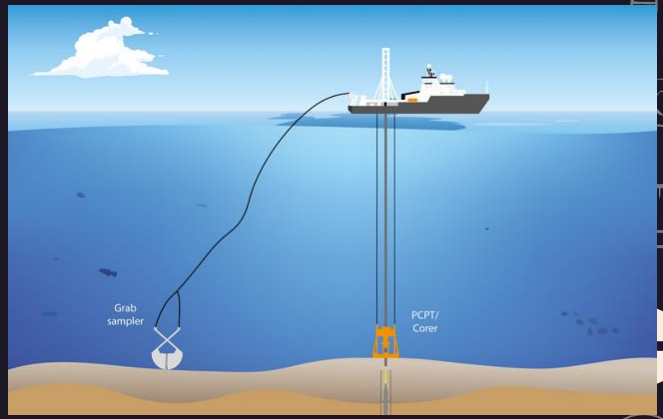
4. Installation

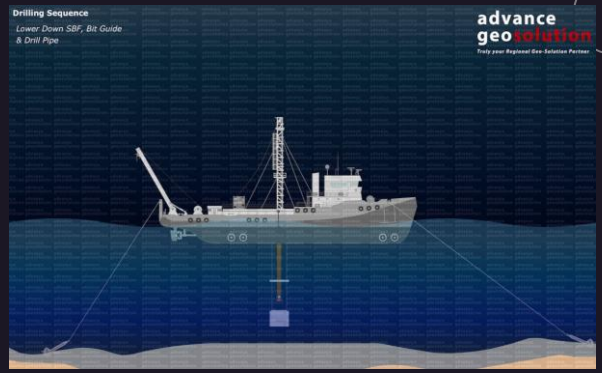
https://youtu.be/xk0HFwH1_JM

SITE INVESTIGATION

The site investigation involves assessing the geology, soil conditions, and other factors that may affect the platform's stability and performance.

The investigation may involve drilling boreholes, conducting seismic surveys, and collecting samples for laboratory testing.



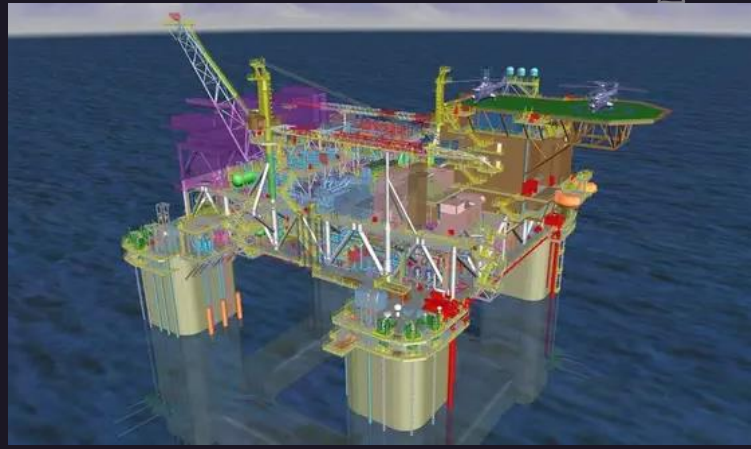


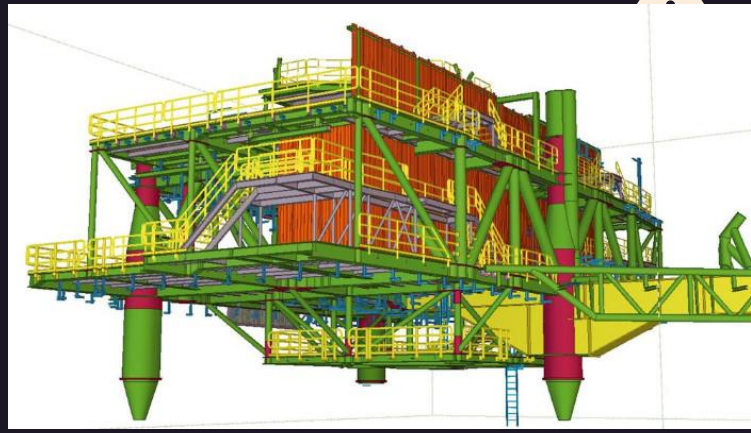
DESIGN

The design of an offshore platform is a complex process that involves multiple disciplines, including structural engineering, marine engineering, and geotechnical engineering.

The platform must be designed to withstand the environmental conditions of the site, including wind, waves, and currents, as well as the weight of the equipment and personnel on board.

The design must also taken into account safety considerations, such as fire protection, escape routes, and emergency response procedures.





FABRICATION

Once the design is finalized, the platform is fabricated in sections onshore or in a shipyard.

The sections are transported to the site and assembled on site.
The fabrication process may involve welding, cutting, and painting the steel sections that make up the platform.

INSTALLATION

The installation of an offshore platform is a complex operation that involves multiple vessels, including crane barges, installation vessels, and support ships.

The platform is installed on the seabed using piles, gravity-based structures, or other methods.

Once the platform is installed, it is hooked up to the production wells and the onshore facilities.

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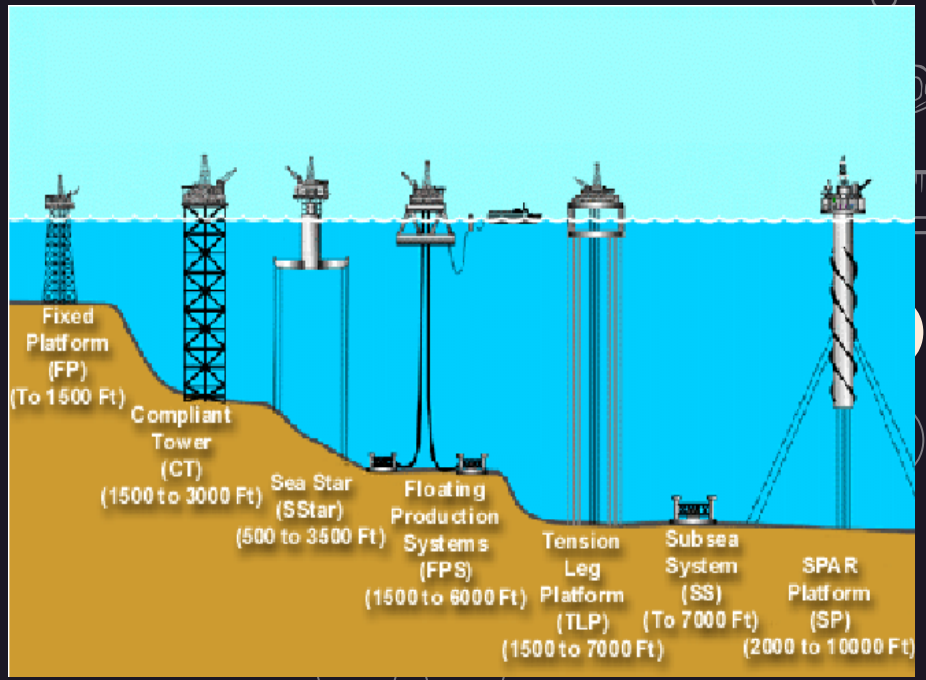
Types of offshore platforms

(depending on the depth of the water, the geological conditions of the seabed, and the type of hydrocarbon reservoir being developed)



Fixed platforms

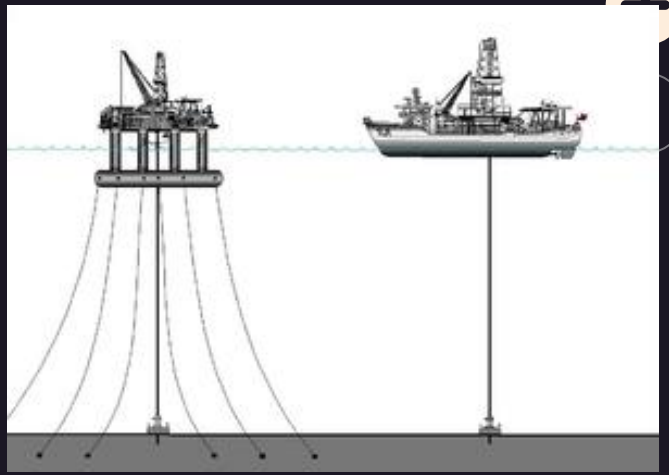
These are the most common type of offshore platform and are typically used in water depths of up to 1,500 feet (450 meters). Fixed platforms are designed to be anchored to the seabed using piles or gravity-based structures, and they are typically used for drilling and production activities.

Complaint tower Platform

These platforms are similar to fixed platforms, but they are designed to withstand greater environmental loads, including strong winds and waves. Compliant towers are typically used in water depths of up to 1,500 feet (450 meters) and are anchored to the seabed using piles or suction caissons.

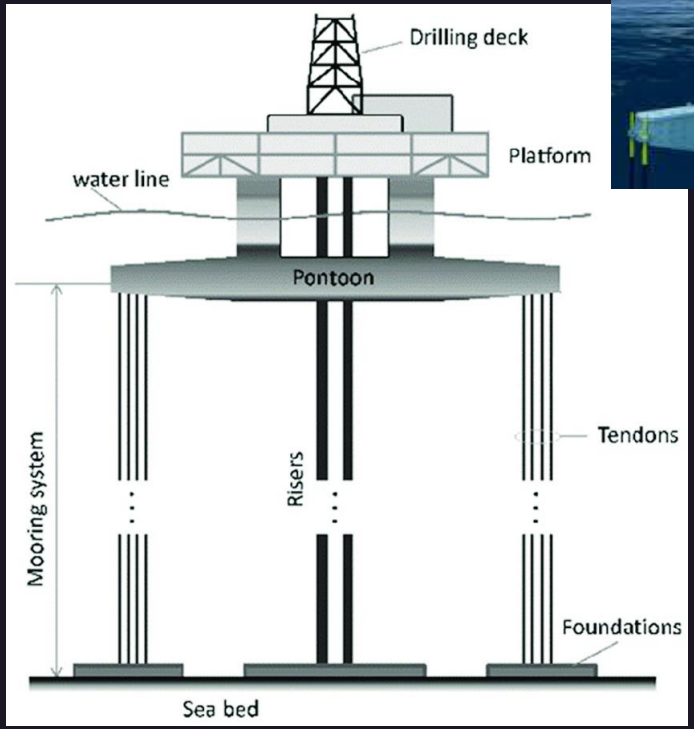
Semi-submersible platforms

These platforms are designed to float on the surface of the water and are anchored to the seabed using mooring lines. Semi-submersible platforms are typically used in water depths of up to 10,000 feet (3,000 meters) and are used for drilling and production activities.



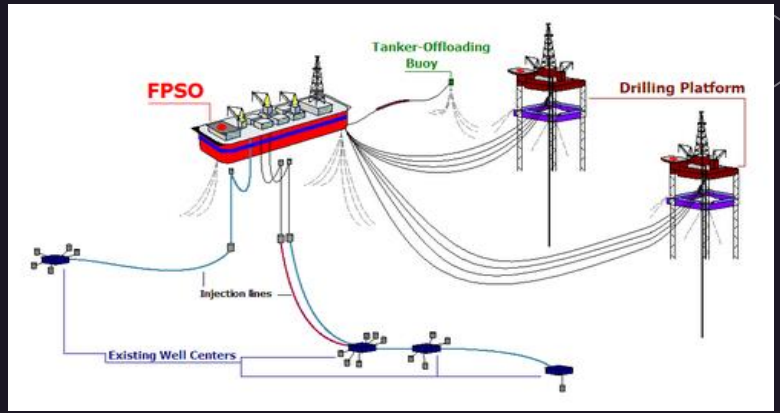
Tension leg platforms

These platforms are similar to semi-submersible platforms, but they are anchored to the seabed using tensioned cables instead of mooring lines. Tension leg platforms are typically used in water depths of up to 7,500 feet (2,300 meters) and are used for drilling and production activities.



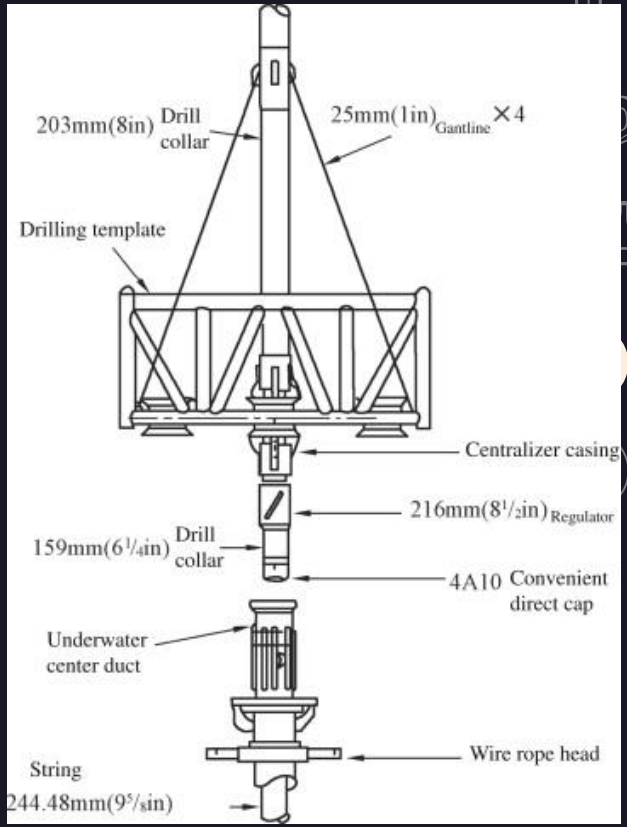
Floating production system

These are large vessels that are used for the production of oil and gas in deep water. Floating production systems include floating production storage and offloading (FPSO) vessels, tension leg platforms (TLPs), and spar platforms. These platforms are typically used in water depths of up to 10,000 feet (3,000 meters).



Subsea templates

These are not technically platforms but are instead subsea structures that support the production of oil and gas from subsea wells. Subsea templates include subsea manifolds, flowlines, and risers, and are typically used in water depths of up to 10,000 feet (3,000 meters).



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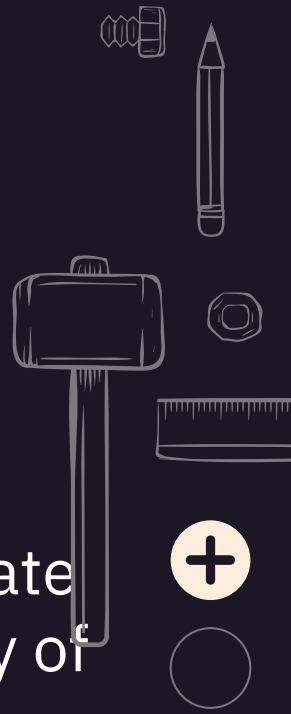
Safety at site

It is a critical aspect of offshore platform design, construction, and operation. Offshore platforms operate in harsh and challenging environments, and the safety of personnel, equipment, and the environment must be ensured at all times.

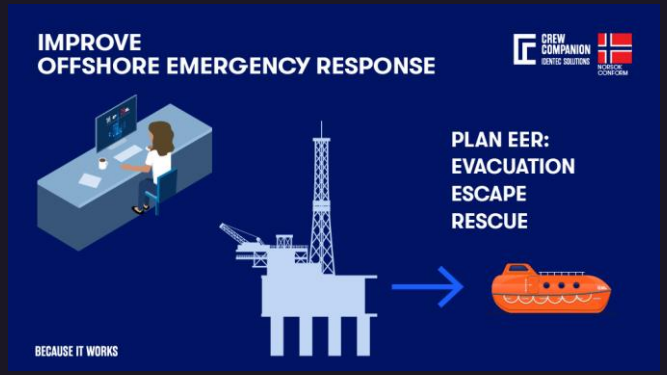


- Structural safety: Offshore platforms must be designed and constructed to withstand extreme weather conditions, including high winds, waves, and currents. The platform's structural integrity must be maintained through regular inspections and maintenance to ensure that it remains safe and stable.

- Fire safety: Fire safety is a critical aspect of offshore platform safety, and platforms must be equipped with fire detection and suppression systems to prevent and control fires. Personnel must also be trained in fire safety and evacuation procedures.

- 3. Environmental protection: Offshore platforms must operate in an environmentally responsible manner to minimize the impact on the environment. This includes monitoring and managing potential impacts such as oil spills, discharges, and noise pollution.

- 4. Emergency response: Offshore platforms must have comprehensive emergency response plans in place to respond to potential emergencies, including oil spills, gas leaks, and fires. Personnel must be trained in emergency response procedures and drills must be conducted regularly.



Questions:

1. What are the stages of the construction process?
2. Name some types of offshore platforms.
3. Explain any one type of offshore platform?
4. Name any 3 safety measures.