

Part I. The Captain Tour- A Virtual Visit to a North Sea Oil Platform

Introduction

1. How many barrels of oil does the Captain Rig produce in a day?
60,000 barrels

Helicopter Deck

2. How often do helicopters arrive at the Wellhead Protection Platform (WPP)? What do the helicopters bring? How many people can the helicopter carry?
They arrive once per day and they bring the personnel from 40 minutes away. The helicopters can carry 2 crew and 18 passengers.

Accommodation (Mess and Galley)

3. How often does the supply boat bring fresh provisions for the galley?
The supply boat delivers fresh provisions once a week.

Drill Deck

4. What material is used to make the drill bits so they can drill through the cap rock?
The drill bits are made out of tungsten/diamond.

Drill Control Room

5. The instruments in the drill control room monitor what type of drill measurements?
Pressure, temperature, drill speeds, drill depths, drill angles, drilling mud levels

Well Heads

6. What is the purpose of all the pipes at the well heads?
22 pipes carry the crude oil from the reservoir. 5 pipes inject water back down into reservoir to replace the oil that was removed. Other pipes take the crude oil from the well heads to tanks for initial separation. Pipes to Bridge Linked Pathway for further separation. Pipes to FPSO for final separation

Chemistry Lab

7. What tests does the chemist perform on the crude oil samples?
Water, crude oil, sand contents, pH, bacteria sampling, corrosion tests.

Walkway to Bridge

8. What do divers attach to the base of the platform legs so that steel won't corrode.
They attach zinc blocks. The zinc is more reactive so it will give up electrons (oxidize) rather than the iron in the steel.

Bridge Link (Middle of Bridge)

9. The bridge links what two platforms?
Wellhead Protection Platform (WPP) and the Bridge Linked Platform (BLP)

Top of Bridge Linked Platform (BLP)

10. What is the main purpose of the BLP?

The BLP serves as a power plant that also does some crude oil processing. They use a combined heat and power (CHP) system that uses excess gasses from the well to power an electricity generator. The fumes and steam from the burning gasses are also used to heat water for the crew on the platform.

Control Room

11. What is the work schedule like for a typical platform worker?

They work 12-hour shifts (7am-7pm or 7pm-7am). Most work 7 days a week for 2 weeks and then have three weeks off on shore. Others work for 2 weeks and then only take 2 weeks off.

Floating Production Storage and Offtake (FPSO) Vessel

12. What is the main purpose of the FPSO vessel?

The FPSO is located about a mile (1500m) from the Captain platform. It separates the crude oil from the gas and water. The crude oil is stored in large tanks and every 10 days it is transferred to an oil tanker. It takes 36 hours to transfer the oil to the tanker.

Part II. The Fawley Tour: A Virtual Visit to Fawley Oil Refinery

Introduction

1. The Fawley oil refinery convert crude oil into what valuable products?

Petrol, diesel, jet fuel, heating oil, lubricating oil, bitumen, plastics, and nylon

South End of Jetty

2. What is the purpose of the jetty? How many tankers come here every year?

The jetty is where tankers unload their shipments of crude oil and pick up refined products. 2000 tankers come here every year.

Jetty Control Room (Jetty Control Block)

3. How often is there someone on duty in the jetty control room? How long may it take to unload a tanker?

Someone is on duty 24-7 in the jetty control room. It could take up to 2 days to unload a tanker.

Salt Marsh

4. Why was the salt march almost dead 50 years ago? What did scientists do to bring the salt marsh back to health?

The plants were coated with oil so they got fried in the sun and died. Scientists replanted grasses that thrive in salt water and they cleaned up the cooling water that flows back through the salt marsh.

South Trestle

5. What happens at the South trestle? What happens at the North trestle?

South trestle: Pipes carry crude oil from the tankers to the refinery. They also carry water in to cool the refinery. North trestle: Pipes carry finished products from the refinery to the jetty.

Admin Block Roof

6. How can engineers in the admin office control valves around the refinery?

Using a touch screen computer

Storage Tank (#307 on 2nd Street)

7. How big are the largest storage tanks? What type of roof does the storage tank have? Why is this type of roof so important?

The largest tanks are 50m in diameter, and 80m high. They can hold 150,000m³ (39.6 million gallons) of crude oil. The storage tanks have floating roofs. They move up and down depending on the level of crude oil in the tanks. This prevents explosions and implosions.

Perimeter Tank (#329)

8. What features insure the safety of the storage tanks?

They are fitted with lightning rods and are monitored by computers. Workers can also manually over-ride the computers if necessary.

Fawley Village

9. What has the Fawley refinery done to keep the residents of Fawley Village safe and happy?

Planted several layers of shrubs and trees between the village and the refinery to quiet the noise coming from the refinery. They installed a COMAH alarm incase there is a major incident at the refinery.

Combined Heat and Power Generation (COGEN)

10. The heat and power produced by the COGEN plant is used to do what?

The heat is used for the office buildings and also to keep some of the thicker products flowing through the pipes around the refinery. The electricity lights and powers the refinery.

Bund by Steam Plant 4 (SP4)

11. What is a bund? What does it do? Who used to cut the grass on the bunds?

A bund is a wall of earth built around each one of the storage tanks. The bunds would contain an oil spill if the storage tanks would leak. There used to be a flock of sheep that would eat the grass on the bunds.

Gate 1

12. For safety, what materials may visitors not bring into the refinery? For safety, visitors may have to wear what type of safety equipment?

Visitors may not bring matches or lighters into the refinery. Visitors may need to wear a helmet, ear defenders, boots with steel toecaps, or even fireproof overalls.

Hythe Terminal (Road Tanker Terminal)

13. Petroleum products can leave the Fawley refinery through pipelines or on tanker trucks. What fraction of Fawley products leave by road?

~2.5%

Fire Station Roof

14. Because it is better to prevent an accident than fix an accident, how much of a worker's time is spent thinking about safety? What helps workers always keep safety at the front of their minds?

Workers spend about a 1/3 of their time thinking about safety. Signs are posted everywhere to keep workers constantly thinking about safety.

Pipe Farm

15. How many gallons of finished products travel through the pipelines every day? Because bitumen is too thick to travel through pipes, how is it transported? What percentage of products leave the Fawley refinery by pipeline?

Ten million gallons. Bitumen is transported by train (2.5%). 85% of products leave by pipeline.