

# Geology in Petroleum Engineering Essay

## Introduction

Bjorlykke defines petroleum engineering as “a field associated with the production of natural gas and crude oil” (19). The exploration, extraction, and production of hydrocarbons are high-tech practices characterized by extensive use of resources. The exploration of hydrocarbons might not be executed successfully without the involvement of geological engineers. The role of these engineers is to investigate and control the impact of earth procedures on human activities such as petroleum extraction. This discussion therefore examines how geology is applicable in petroleum engineering. The paper goes further to explain why geology has become one of the core courses for petroleum engineering educational programmes.

## Application of Geology in Petroleum Engineering

The extraction of various hydrocarbons begins with the placement of oilfield structures on the targeted location. Throughout the process, petroleum engineering companies must complete numerous geological surveys. Such companies will definitely outsource geologists or employ them to complete such surveys. These studies must be completed before any construction begins (Hyne 19). This is the case because the foundation of the targeted oilfield structures must be designed in accordance with the aspects of the terrain. This practice is done to ensure the extraction process is conducted without any challenge.

More often than, oil deposits and hydrocarbons are “discovered in the most unlikely places such as at seas” (Hyne 26). When reserves of oil are discovered, it is mandatory to undertake various activities such as Remotely Operated Vehicles (ROV) and Shallow Seismic (SS) surveys. It is agreeable that many oil drilling firms contract these services from geological engineers (Weszkalnys 618). This fact is a clear indication that geology is an important field that cannot be separated from petroleum engineering.

Before undertaking any oil exploration process, petroleum companies must use the findings presented by geological engineers or geoscientists (Taylor 3). For instance, geologists use a wide range of tools such as chisels and hammers to collect soils samples. They go ahead to use technological equipment to search for mineral deposits and oil reserves (Hyne 72). Geoscientists use radar equipment to identify regions that might have mineral deposits. This fact explains why petroleum engineering is supported by the activities, competencies, and skills of these geoscientists.

During the discovery process, petroleum companies collaborate with geologists to search for oil deposits (Taylor 5). Geological engineers work with various agencies and organizations to preserve the environment. Bjorlykke believes that environmental conservation is something that has gained much support with the past six decades (47). The case of Beyond Petroleum (BP) can be used to examine the relationship between petroleum engineering and geology. The infamous “BP oil disaster started in 2010 in the Gulf of Mexico” (Hyne 104). After the disaster, BP liaised with many environmentalists and geoscientists to ensure the most appropriate measures were put in place to deal with the leakage.

The other critical issue is that geoscientists (and petroleum geologists) possess adequate competencies that make it easier for them to target specific regions for oil. Additionally, the petroleum geologist will provide evidence-based information that can be used whenever undertaking any oil exploration activity (Bjorlykke 48). The scientists can successfully estimate the amount of gas or oil deposits in a specific region. That being the case, petroleum engineers can use this information to pursue their objectives (Taylor 5).

The above arguments explain why petroleum engineers might not realize their goals without the support of geologists. With petroleum being one of the major resources used to support every economic activity, new measures have been considered in order to explore and identify new oil deposits. Many petroleum exploration companies have therefore continued to contract different geologists in order to realize their potentials (Bjorlykke 59). Additionally, many institutions teaching petroleum engineering have included geology as one of the core courses. This has been the case because the field is of great relevance to petroleum engineering.

Geology has become a critical field that is embraced in the world of oil exploration and extraction. Although some analysts have argued that geology is important for reservoir engineers, the most outstanding fact is that the field is applicable throughout the oil production process. Every type of petroleum engineering will definitely benefit from various geological concepts and competencies (Hyne 82). For instance, a proper understanding of geology can make it easier for petroleum engineers to analyze the absorbency of various rocks.

Experts in geology can also use various indicators to analyze the presence of various minerals. This means that different engineers including petroleum experts will benefit significantly from this field. A proper “background in geology will make it easier for oil explorers and engineers to examine the big picture when trying to discover hydrocarbons” (Taylor 6). This knowledge will make it easier for the engineers to examine rocks carefully and determine whether they contain certain minerals.

This understanding can help petroleum engineers to complete oil reserve reports. They can also use their skills in geology “to survey and present detailed graphs showing the projected oil production volumes” (Taylor 6). They can successfully when the production might start to decline (Hyne 87). After exhaustion of the reserves, petroleum engineers with a background in geologists can use their concepts to implement environmental mitigation initiatives.

Because of the aspects associated with petroleum engineering and geology, new academic programmes have decided to combine the fields (Weszkalnys 621). Most of the targeted learners acquire new ideas about the physical world and its past history. Specific geological processes such as crustal movements and volcanic activities are taught in such classes. Many students pursuing the course learn much about geophysical processes, sedimentary basins, conventional reservoirs, and nature of hydrocarbons.

Modern technology is supporting the goals of many petroleum engineers. This fact explains why many students pursuing various academic courses in petroleum engineering are taught how to use computer applications and geologic maps (Bjorlykke 94). These skills can make it easier for petroleum engineers to identify regions that contain considerable oil deposits. The other

undeniable fact is that future petroleum engineering scholars will be equipped with new skills in geology in order to pursue their career objectives successfully.

## **Conclusion**

Geologists are known to use their competencies to analyze earth-structure interactions and examine how various seismic processes impact different artificial activities (Weszkalnys 632). That being the case, petroleum engineering is a field that cannot succeed with a detailed background in geology. Companies exploring hydrocarbons in different regions will definitely require the skills of geoscientists and geological engineers. The strategy will make it easier for more corporations to realize their goals and maintain the integrity of the natural environment. In conclusion, these facts show conclusively that geology is a useful field that has numerous applications in petroleum engineering.

## **References**

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