

## **The Requirements and Job Market, Three Fields, and the Future for Petroleum Engineers**

### Abstract:

Without question, the price of oil and energy has climbed and will continue to climb in the future. The increasing need for world energy results in a greater demand for petroleum engineers to supply the world with fossil fuels. This paper will discuss the requirements and job market, three fields (reservoir, drilling and production), and future for petroleum engineers. Graduating petroleum engineers have an excellent job market with exceptional wages. Facts and statistics obtained from personnel interviews, government agencies, and professional organizations form the papers credibility and basis. High school students who enjoy math and science should considered petroleum engineering as their field of study.

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## I. INTRODUCTION:

Colonel Drake initiated the United States to oil production in 1859 when he drilled the first oil well in Oil Creek, Pennsylvania, according to Daniel Yergin, *The Prize* (7). The “father” of the modern oil industry was John D. Rockefeller due to his dominance from 1865 to 1911 when his company, Standard Oil Company, was the first to be declared a monopoly by the Supreme Court, as stated by Dr Chase, the Department of Petroleum Engineering Chair at Marietta College (4).

The Encyclopedia of Careers and Vocational Guidance asserts, the first petroleum engineering universities in the United States simply taught the methods of finding oil and drilling wells, which were extremely basic due to a lack of technology (5). Today, a college curriculum for a petroleum engineer is more diverse. Dr. Chase stated today’s curriculum is directed toward the recovery of oil and gas, but touches all aspects of the industry (4).

In recent months, the price of oil has soared to over sixty dollars a barrel. High oil prices and increasing energy demand results in increasing job security for a petroleum engineer. Graduating petroleum engineers have an excellent job market with exceptional wages, not only after graduation, but also in the summer. There are three fields (reservoir, drilling and production engineering) a petroleum engineer may specialize in, each having different job requirements and locations. The history of oil prices show a trend of rise and fall resulting in an unsure future for the oil and gas industry. The following text will include the requirements and job market, description of the three fields, and future for petroleum engineers.

## **II. REQUIREMENTS:**

As in most professional jobs today, a college education is required in becoming a petroleum engineer. At Marietta College, the petroleum department encourages and assists students in obtaining a summer internship job with a petroleum company.

According to Dr. Ben Thomas, a professor in the Petroleum Engineering department at Marietta College, these summer jobs help each student gain experience and allow the companies to get to know each student (2). The connection between student and company aids in Marietta College graduates beating other graduates in the search for jobs in an extremely competitive market. Dr. Chase asserted the summer internships assist in the 100 percent job placement boasted by Marietta College's Petroleum Engineering Department (4).

## **III. JOB MARKET:**

The job market for a full-time petroleum engineer greatly depends on the price of oil, as said by Dr. Thomas (2). According to the Occupational Outlook Handbook (OOH), there were about 14,000 jobs held by petroleum engineers in 2002 and the number of openings will exceed the number of members of a Petroleum engineering program (1). Pay for a petroleum engineer, as with most jobs, depends on job experience. In 2002, 83,370 dollars was the median earning of a petroleum engineer, according to the OOH (1). According to Marietta College's Petroleum and Geology Fact Sheet, salaries for 2006 graduating petroleum engineers range from 50,000 to 72,000 dollars (3).

#### **IV. THREE PETROLEUM FIELDS**

##### **A. RESERVOIR ENGINEERING**

A reservoir engineer attempts to understand a producing or potential reservoir. Each reservoir has different characteristics which affect the production of the oil or gas (4). He or she determines the most efficient way to produce oil or gas from a reservoir. Today, reservoir engineers are able to run complex computer simulations on different “what if” circumstances which aids in becoming more prepared for unexpected occurrences when producing a well (2). According to the Society of Petroleum Engineers, another important requires a reservoir engineer to estimate the amount of total oil and/or gas in a reservoir (6). This is important because the value of an oil and gas company depends on the amount of reserves the company owns (6). Jobs as a reservoir engineer are strictly office jobs, but occur throughout the United States and World.

##### **B. DRILLING ENGINEERING:**

A drilling engineer is responsible for drilling and completing a well. Before drilling commences, the drilling team works with geologists and geophysicists to determine the most efficient procedure to complete a well (2). A drilling engineer is in charge of the drilling contractor (including all personnel), compliance personnel, and other members of the company’s drilling team during the drilling process (6). After the well is drilled the completion procedure is carried out and sometimes modified by the drilling engineer. The completion of a well consists of facing (breaking a rock formation to increase permeability) a well and perforating the steel casing run in a well. Jobs as a drilling engineer usually require the engineer to be in the field with the drilling rig. There

are rigs, especially in the Gulf of Mexico, which are able to communicate via satellite allowing the engineer to run a rig from an office thousands of miles away.

### **C. PRODUCTION ENGINEERING:**

A production engineer is responsible for the upkeep of a well, any surface equipment at the well site, and any producing fluid (oil, gas, or salt water) until the fluid reaches its desired delivery point (2). The production engineer's job requires him or her to optimize, interpret, and analyze individual well's performance (6). As oil and gas fields mature, the responsibility of a production engineer also includes enhancing production of a well (6). Production engineers rely on field personnel to perform all necessary adjustments to the well and any surface equipment at the well site. Due to this collaboration between field personnel and production engineers, production engineers are required to be in the office and field throughout their career.

### **V. THE FUTURE OF PETROLEUM ENGINEERING:**

The future of employment for a petroleum engineer greatly depends on the price of oil and the demand for energy. Increasing oil prices will impact the number of wells drilled by oil and gas companies. According to the Baker Hughes website, the average drilling rig count in the world has increased by 500 from 2004 to 2005 (8). In the United States; however, jobs are going to decrease. According to Dr. Thomas, the United States imports approximately sixty percent of its oil, which will increase with time, due to the decrease in domestic production (2).

**VI. CONCLUSION:**

In conclusion, the field of petroleum engineering appears to be a promising field of study. Oil prices reaching record breaking prices and energy needs continuing to clime, companies will continue to drill more wells all over the world resulting in more job opportunities. This surge in prices comes at a great time for graduating engineers. All students considering engineering ought not to look past petroleum as their specialized field.

## VII. WORKS CITED

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