

The Compensation and Motivation of Petroleum Engineers

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Introduction

The assets available to any company are frequently divided into three major categories — money, materials, and manpower. Petroleum engineers spend a large percentage of their professional time making the most of the first two. Employment and effective use of the third asset, manpower, is the primary concern not only of many company executives, but also of every individual petroleum engineer.

Industry's salary administration programs, compensation plans, and employee incentives directly reflect industry's policies and long-range plans regarding manpower. Long-range plans of companies always include consideration for manpower requirements. Here is a typical example of a manpower policy statement included in a major oil company's long-range planning program:

Institute programs required to insure that no existing operation, growth area, or diversification program will be delayed or dropped because of the lack of qualified personnel.

To accomplish this kind of policy, it is necessary to employ and motivate the number of petroleum engineers that operating managers feel are necessary to conduct their business. The purpose of this paper is to correlate the policies and practices that companies adopt to obtain, retain, and effectively use petroleum engineers with salary administration programs, compensation plans, and employee incentives.

Obtaining Engineers

Salary Administration — Starting Salaries

To obtain petroleum engineers, companies respond to simple market supply and demand in setting starting salaries. Supply is reflected by college petroleum engineer enrollments, and demand pressures are reflected in starting salaries. It does not take a great deal of logic to explain the continuous upward movement of starting salaries.

Fig. 1 shows the trend of total enrollment of petroleum engineers graduating over the last 12 years. It follows that the greatest inflation of starting salaries will occur when the supply of the desired skills is low and not equal to demand. When a company's need for petroleum engineers becomes critical enough, the company will decide to pay a competitive salary or accept the fact that operations will be delayed or averted for lack of manpower.

Fig. 2 shows the trend of increase in average starting salaries over the last 6 years. The rate of increase has reached a high of about 7 percent/year. As long as the supply of petroleum engineers continues to fall short of companies' demands, this rate of annual increase can be expected to continue.

Adjustment of Internal Salaries

Another salary administration fact is that rapid inflation of starting salaries will also cause rapid inflation of salaries paid for experienced personnel. It is illogi-

The policies and practices companies adopt to obtain, retain, and effectively use petroleum engineers are identified in terms of salary administration programs, compensation plans, and employee incentives.

cal to pay an engineer graduate with several years of experience less money than a new graduate with no experience. Absurd as this sounds, this is exactly what happens when the internal rate of salary increases does not surpass the rate of starting salary increases. Therefore, the salary increases given to experienced petroleum engineers, in a year when starting salaries go up 7 percent, must exceed 7 percent if reasonable internal alignment relationships are to be maintained.

Fig. 3 is a maturity curve presentation of salary data. It reflects average salaries paid engineers in one major oil company vs years of experience. These curves usually have a positive slope, indicating that internal salaries not only have kept up with starting salary inflation, but also, in fact, have exceeded starting salary increase rates.

At this point, company executives must answer several questions. Are we willing to pay a competitive starting salary? If not, are we willing to suffer the lack of manpower needed to do our jobs? The answers to these questions seem obvious. Next, are we willing to suffer the loss of experienced engineers who will inevitably go to companies that do keep their internal salaries in proper relation to starting salaries? Again, the answer seems obvious.

Simple arithmetic and knowledge of starting salaries dictate the action a company must follow to offer competitive starting salaries. Many sources of data clearly identify the salaries required; these sources include college placement offices, the Engineering Manpower Commission, trade journals, college petroleum engineering departments and company salary surveys.

The question of internal alignment is more complex. Salary administration programs adopted by companies should provide sufficient flexibility and capacity to keep internal salaries in the proper relationship to starting salaries. Some companies periodically adjust salaries on a blanket basis for all petroleum engineers. Others have adopted programs of selective salary treatment keyed to performance. Whatever the program a company selects, the starting salary is always a clear reference point. Regardless of whether one is a recent graduate or an experienced engineer, he can draw his own conclusions about the salary treatment he can expect now and in the future.

Retaining Engineers

Compensation plans — the second major category — correlate with the second manpower objective of retaining desired personnel. These plans and programs usually are associated with benefits and privileges offered employees, and some of the ones included in this area would be:

1. Aid to education — tuition refund, scholarships, grants to colleges, special courses, abstract services, libraries, televised classroom presentations at company locations and company training and development programs.

2. Savings plans and retirement systems — savings plans in which company-matching funds vest to em-

ployees after a certain period of time, and retirement systems that provide for greater return to individuals with longer service.

3. Vacations and time off with pay — programs that provide for increased time off with pay as length of company service increases.

4. Insurance programs — group and individual plans (many of which are partially underwritten with company funds) covering accident, health, and life as long as an employee remains with a company.

Certainly there are other benefits and privileges that influence to some degree the retention of personnel. And although compensation programs were not originated nor designed simply to retain personnel or reduce attrition, surely it is agreed that everyone considers the benefits and privileges he might lose before he resigns from a company.

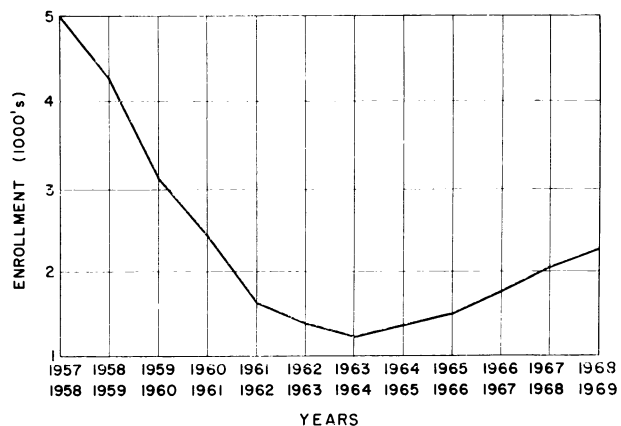


Fig. 1—Total petroleum engineering enrollment in U.S.

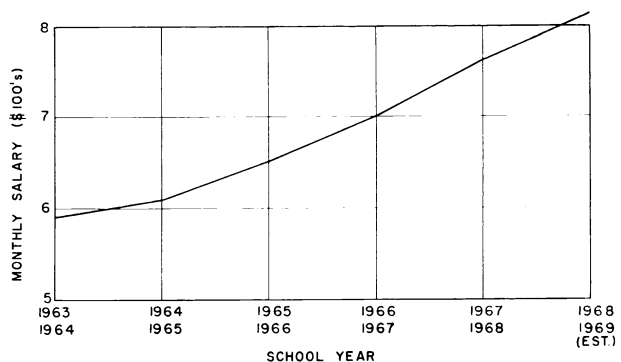


Fig. 2—Average starting rates for engineers in petroleum and natural gas industry.

Effectively Using Engineers

The next category, incentives, relates directly to the effective use, in its broadest interpretation, of petroleum engineering manpower.

The term "incentive" is defined as that which entices or tends to incite determination or action — in a word, motivation.

Oddly enough, behavioral science experts agree that salary, benefits and privileges are among the least significant factors that motivate professional employees to higher performance. They become maintenance factors and can generate a degree of dissatisfaction, but rarely do they provide any incentive to higher productivity. Therefore, much effort, thought and research have gone into policies and programs designed to make better use of professional employees and create higher motivation. Interesting and useful

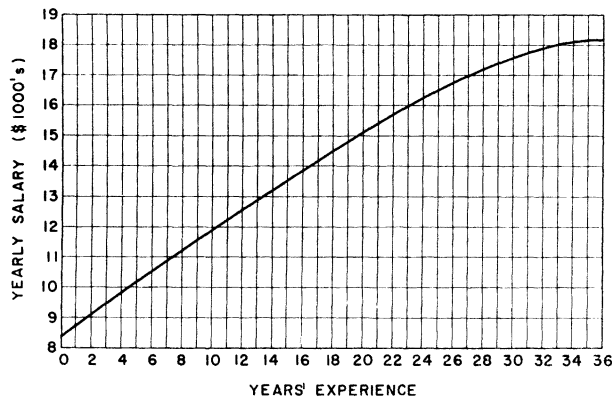


Fig. 3—Median salaries of engineers in a major oil company.

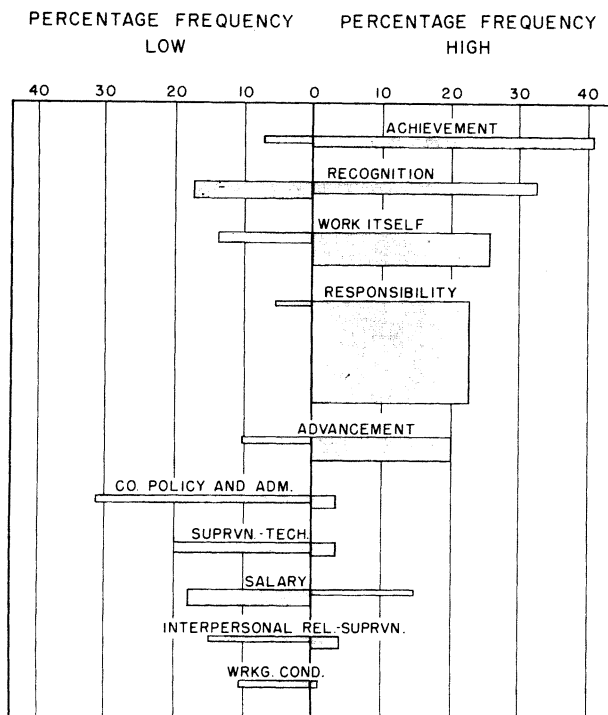


Fig. 4—Distribution of factors affecting job motivation.

data have resulted from the research.

Fig. 4 shows the results of research done by Frederick Herzberg, a behavioral scientist. Herzberg identified 10 significant factors affecting motivation.¹ They include achievement, recognition, the work itself, responsibility, advancement, company policy and administration, technical supervision, salary, interpersonal relations and administrative supervision, and working conditions.

Fig. 4 is a chart prepared by Herzberg in which the length of the bars to the left or right of the center line reflects the frequency with which individuals included in the research project mentioned periods of low or high job motivation. The thickness of the bars represents how long these feelings tended to last. The top five factors listed on the upper part of the chart are job "satisfiers" or "motivators". The five factors on the bottom half of the chart tend to be "dissatisfiers", which, by themselves, do not strongly motivate individuals. This figure shows that benefits and privileges, salary, and other related areas often are sources of dissatisfaction, but in no case do they result in the frequency or duration of feeling of positive motivation fostered by the five factors on the top half of the figure.

This information, like starting and internal salary data, provides a basis for establishing certain practices and policies for companies to follow. Companies recognize the significance of the positive motivating factors and their importance in formulating professional employee policies and programs. Skills inventories, performance evaluation programs, development and training programs, performance salary programs, and general professional environment are some of the areas where specific programs have been developed to capitalize on this knowledge of human behavior. For example:

1. Skills inventories identify candidates for advancement to positions of greater responsibility. Advancement to more demanding positions sets the stage for an individual to achieve goals and results for which he can be legitimately recognized. A skills inventory program, properly used, gives a company an opportunity to capitalize on the desirable aspects of all five of the positive motivators shown on the Herzberg chart.

2. Performance evaluation programs provide an opportunity to recognize achievement of an individual in the work he is performing — once again, note the top three factors concerning positive motivation.

3. Development and training programs recognize an individual's potential for further development and growth and improve his competence and capability to handle higher level work.

4. Performance salary programs offer a chance to relate salary increases to the work itself and to recognize desirable performance and notable achievement.

5. Professional environment offers an individual an opportunity to function freely to his highest capacity as a professional. He has an opportunity to realize the satisfaction of "self-actualization", which, according to A. H. Maslow, another behavioral scientist, is the highest order of psychological need.²

Each individual petroleum engineer has many opportunities to employ the knowledge of these positive motivating factors in his personal and professional life every day. Companies are cognizant of the influence of these motivating factors on the performance of professional personnel and certainly will consider them in the administration and development of manpower policies and programs. Each petroleum engineer should gain much in development, advancement, and self-satisfaction because of the programs that companies follow to obtain, retain, and effectively use their most valuable asset — manpower.

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