

# Analysis and Countermeasures Research of The Current Compensation System among Chinese Scientific and Technical Petroleum Professionals

## ANALYSE ET RECHERCHE DES CONTRE-MESURES DU SYSTEME RECENT DE COMPENSATION ENTRE LES PROFESSIONNELS PETROLIERS DES SCIENCES ET TECHNOLOGIES CHINOISES

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**Abstract:** Compensation has become a more complex and important management tool in the knowledge economy. This paper analyzes key issues played by scientific and technical petroleum professionals. Results of a survey of technical professionals are presented, followed by suggestions for improving their satisfaction and productivity.

**Key words:** scientific and technical talents, remuneration, motivate, salary, compensation

**Résumé:** La compensation est devenue un outil de management plus complexe et important dans l'économie intellectuelle. Cette thèse fait une analyse des issues critiques par les professionnels pétroliers des sciences et technologies chinoises. Les résultats d'une enquête des professionnels techniques sont présentés, suivis par les propositions pour améliorer leur satisfaction et productivité.

**Mots-Clés:** les talents scientifiques et technologiques, la rémunération, motiver, compensation

### 1. INTRODUCTION

With the coming of the age of knowledge economy, intellectual talents have become the most valuable resource promoting the development of an economy. The two core components of knowledge economy are science and technology, and the resource of talents, which comprise the fundamental impetus for the knowledge economy (Wang Yanshi and Liu Mingzhong, 2001). Thus, the technical domain is a very important form of working, and technical talents become very important human resources.

Reviewing the history, science and technology has involved in every step of the development course of petroleum industry. That is to say, the country without sufficient technological capacity cannot secure and utilize its petroleum resources. The petroleum industry depends on the innovation and promotion of science and technology much more than most other global industries (Yazhou, 2003). So it is clear that science and technology is the core part and plays an important role in the industry's development.

Since the 1980s, the rapid development of new

technologies has produced huge effects on the development of the petroleum industry. From 1981 to 1996, the update ideas of oil field development and the advanced technology of oil extraction had reduced the unit cost of oil exploration by two thirds, and the exploitation cost had been reduced significantly (John Darley, 2003); Today, a large number of technologies such as oil and gas exploration and exploitation, storage and transportation in the P.R.C. have reached or been close to the contemporary international advanced level. The application rate of the result of scientific research in petroleum industry reaches 80 percent and the rate of contribution of science and technology advancement is up to over 40 percent, which is higher than the average level of national industrial departments (Securities Times, 20 November 1997). Therefore, technologies will become significant powers and will affect the survival and development of petroleum enterprises in competition. It will also be of direct and far-reaching meanings for the petroleum enterprises to promote their core competitive capabilities.

Therefore, the scientific and technical talents as the carriers of science and technology represent one of the core forces for supporting and promoting the development of petroleum enterprises. Thus, it is

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\*Received 2 February 2006 ; accepted 10 March 2006

critical for petroleum enterprises to understand the role played by the compensation levels of scientific and technical talents in the petroleum enterprise, to adjust individual salaries based on working characteristics, and to foster innovation and enthusiasm through an effective salary system that reflects and inspires the value of human capital.

## 2. RESEARCH METHOD

A survey has been developed to assess factors associated with current compensation levels among scientific and technical petroleum professionals. This survey is based on issues raised in personal interviews and through numerous discussions with these professionals and their managers. A final version was developed after three revisions and includes six aspects: (1) fairness and rationality of the salary and its structure, (2) perfection of the salary system, (3) situation of welfare and treatment, (4) state of performance appraisal and training, (5) factors and level of payment, and (6) salary satisfaction.

In the process of research, we have selected three typical oil fields in the P.R.C. to investigate. Of the 380 surveys sent, 324 were returned, resulting in a response rate of 85 percent. The survey was repeated in the same oil field at another time and produced similar results, suggesting strong reliability. In addition, the survey results reinforce the findings from the personal interviews, suggesting strong validity. The three oil fields are all state-owned enterprises, disseminated in the southern, central and northern areas in China, and the scale differences are sufficient enough to represent the salary state of scientific and technical talents from different types of oil fields in China. Therefore, it is appropriate to use these questionnaires in the research of this paper.

## 3. FINDINGS AND ANALYSIS

The following findings have emerged from the analysis of the surveys.

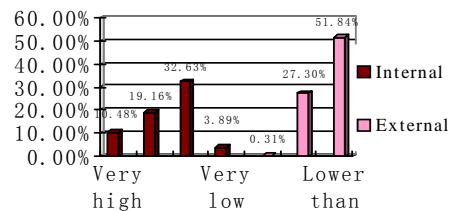
### 3.1 The overall level of the salary is comparatively fair, but the rationality of its structure is not very high

60 percent of the scientific and technical talents think that their salary basically rational and equal to their work; however, there are still almost one third of the scientific and technical talents think that their salaries are not commensurate; almost half of the scientific and technical talents do not think that their position values

are appropriate. Although some degree of salary dissatisfaction can always be expected, further analysis is suggested.

The level of satisfaction to the equality of inside and outside salary is relatively low. Compared with the internal equality, the dissatisfaction to the external equality is larger (see Figure 1). This shows that nearly 37 percent of the interviewees think their salary level is

Figure 1 Comparisons for the internal and External Salary Levels

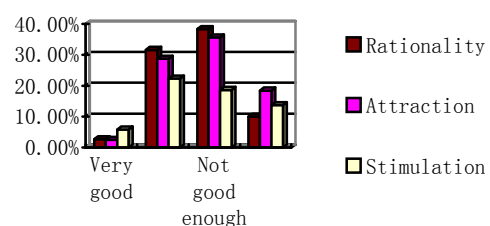


relatively low comparing with the personnel in the same post for the inside equality; and about 52 percent of the interviewees think their salary is lower than that of the personnel in the same post in other fields. The introduction of the mechanism of market price for the salary of scientific and technical personnel in the petroleum industry is insufficiently implemented; it appears that the value of scientific and technical talents does not receive enough attention.

### 3.2 The system of salary management is structured effectively, but compensation levels do not always serve as motivators

The work of salary payment and discussion on salary design is well done in each oil field, over 80 percent of the interviewees think the salary is accurately paid in time, about 45 percent of the interviewees think the work of opinion collection is well done, and 53 percent think the satisfaction is relatively high as the oil field responded actively to their opinions. Generally, the salary system is well structured. Most of the scientific and technical talents agree that the actual salary system inclines or distributes according to work to the personnel of scientific research, management and production workers, and 70 percent of the interviewees think the system is carried out comparatively strictly. Therefore, it can be considered that there are corresponding policy guidance to the distribution of salary and the system to ensure its execution in the oil fields.

Figure 2 Rationality, Attraction and Stimulations of the Salary System

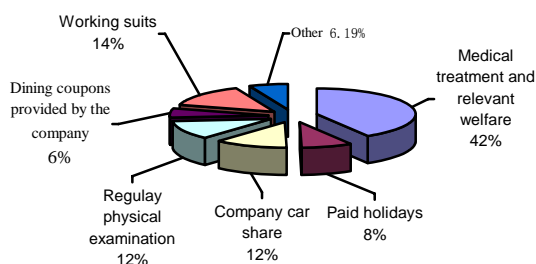


According to the salary system, however, half of the scientific and technical talents find it to be neither reasonably nor attractive. Additionally, they show lower satisfaction with the stimulation of the salary system (see Figure 2). 35 percent of the personnel think the salary system is relatively scientific and 31 percent of the personnel think the system comparatively highly attractive. However, only 28 percent of the interviewees think the stimulation of the system is effective. This indicates that the existing salary system is not set up on the basis of the characteristics of scientific and technical talents, thus it cannot incarnate the value of their work well.

### 3.3 The welfare is lack of variety, and the satisfaction degree is low

Most of the interviewees agreed that the current work conditions are able to meet the work needs, but they are not satisfied with overtime compensation. Hence, the work time of scientific and technical talents is irregular on one side, and the current salary system is not capable of measuring and incarnating the contribution of scientific and technical talents in their irregular working time.

Figure 3 Welfare for the professionals in the petroleum enterprises



The current domestic legal welfare is focused on the “five insurances and one fund,” but the welfare provided by the enterprises is less. Results indicate that medical treatment and relevant welfares, work suites and regular physical examinations are the three main welfare measures that can be enjoyed by scientific and technical petroleum talents at the present time. Among them, the proportion of medical treatment and relevant welfares is the most substantial, which is up to nearly 40 percent (see Figure 3). Only about 14 percent of the interviewees think that the variety of welfare has changed to some extent in recent years. The proportion of the interviewees agreed that the variety has changed and the amount of welfare has also increased is also 14 percent. Hence, the summation of these two groups account for about 28 percent of all interviewees. Therefore, the scientific and technical talents share almost the same welfare as the ordinary employees do, which did not incarnate the characteristic of scientific

and technical personnel as the intellectual human capitals. The result of investigation shows that 60.3 percent of the scientific and technical petroleum talents are not satisfied with the current welfare, and the satisfaction degree is generally poor.

### 3.4 The system of performance appraisal is administered effectively, but the attention to training and the investigation of that is low

The system of performance appraisal is helpful for enterprises to assess the work of employees scientifically and rationally, as the basis of salary payment and employee training. Training is a kind of non-economic remuneration. It does not only improve the technology of the scientific and technical talents, but also increase the salary, as the salary is tied up with the level of technology to some extent.

As the results of the investigation show, the system of performance appraisal has been established in oil fields, the payment of performance salary is generally based on it. But the system required additional adjustment. In the past year, almost half of the scientific and technical talents received only a few opportunities for training, or even none. Hence, oil fields have ignored the important meanings of training for the scientific and technical talents.

### 3.5 The level of salary is not quite increased

Generally, there is a certain relationship between the salary of scientific and technical talents in oil fields and the benefits of the enterprises, which however is not very close. The profits of petrochemical industry have since 2002(Hong Zhang, 2004). In this case, nearly 70 percent of the interviewees think that the level of salary has been some increased for the past three years, although the range of the increase is not so large on the whole.

### 3.6 The traditional distribution mechanism is mostly adopted to select the factors of salary, and the satisfaction degree is rather low in the mass

The title of a technical post and the level of administration are two decisive factors in determining the compensation of the scientific and technical talents, as the traditional distribution mechanism is currently adopted by most of oil fields. The factors those are directly relevant to the performance such as individual contribution, and workload cannot decide the salary directly.

For the current system of salary, about 40 percent of

the scientific and technical talents think that the salary should be fixed in the form of "basic salary + project/subject internal distribution + encouragement salary"; about 23 percent of the interviewees think that the system of post salary should be adopted. Simultaneously, the interviewees also agree that the annual prize, deduction from the patents rewards and the popularizing and application of the fruit should be considered as three factors to stimulate the scientific and technical talents.

### 3.7 Employee resignations are worthy of consideration:

In the investigation of the reason of the resign, almost half of the scientific and technical talents agree that at least part of the impetus for employee resignations lie in compensation levels. This shows that the salary of scientific and technical talents cannot incarnate their values very well. Additionally, other factors related to the inside salary also influence the resignations of scientific and technical talents.

Overall, scientific and technical petroleum talents are generally satisfied with their compensation levels. However, the system is not appropriately reasonable, motivating, attractive, or rational. In addition, the welfare and training also need further improvement.

## 4. CONCLUSIONS AND ADVICES

### 4.1 Reason analysis:

The following conclusions are offered:

**4.1.1** The reason of the system: All petroleum enterprises in the P.R.C. are state-owned at present. Under the influence of a long-term planned economy, scientific and technical talents in the petroleum industry do not receive enough attention in ideology. The long-term management of scientific and technical talents is similar to that in the military and can neither effectively motivate scientific and technical professionals nor compensate them effectively. As the exploration and exploitation of petroleum are highly difficult, the pressures of scientific and technical petroleum talents are enormous, and the transformation of scientific research fruit is much more difficult. It has great characteristics of time lag and concealment, as it often takes a lone time to incarnate the profit of the fruit of scientific research gradually, which makes it impossible to incarnate and measure the contributions of scientific and technical talents in the short-term.

It takes huge investments to realize and transform any fruit of scientific research in petroleum industry, and it brings enormous losses to an enterprise once it fails. The work of scientific and technical petroleum talents is much more dangerous and oppressive. The

knowledge and technique of scientific and technical petroleum talents is only considered valuable in the field of petroleum, and it cannot be regarded so in other fields.

**4.1.2** The working characteristics of scientific and technical petroleum talents: Qiu Zhongjian of the Chinese Academy of Engineering has noted that the level of talents directly determines the success or failure of tackling of key scientific problems, so it is an important task for the petroleum enterprises to absorb and train outstanding talents. Scientific and technical talents are extremely important human capitals as the value of petroleum enterprises. To acknowledge and attach importance to the value of the work of scientific and technical talents, the property rights of human capitals must be clear, and the both of them are so inseparable that the value of property profit relies on the value of their work.

Generally speaking, the work of scientific and technical talents has the following characteristics (Junsheng Liu, 2003):

- ① Scientific and technical work is a kind of complicated mental labor of high intensity, which is hard to supervise and measure in the course of working;
- ② Large workload and time consumption creates enormous pressure;
- ③ It is a kind of creative work, with risk and uncertainty;
- ④ Scientific and technical talents have high prices in the market and high rights with low positions.

Besides the generalities above, the work of scientific and technical petroleum talents still have certain particularities:

- ① The long-term management in a military form, with chronic illness in the planned economy;
- ② The fruit of science and technology in petroleum industry has characteristics of time lag and concealment;  
The work of scientific and technical petroleum talents is risky;
- ③ The human capitals of scientific and technical petroleum talents are unique.
- ④ As a result, great losses could occur if the compensation system is not addressed appropriately. Therefore, the existing system of distribution should be reformed and the relevant system should be established to attract and retain the scientific and technical petroleum talents, accelerating the common development of the enterprise and the personnel.

### 4.2 Advices:

For the problems mentioned above, this paper proposes the following suggestions and measures:

**4.2.1** Designing and revising the existing salary system, combining the working characteristics of scientific and technical talents. The existing salary system should be

redesigned and innovated, according to the development of modern salary systems, combining the working characteristics of scientific and technical petroleum talents. Processes for the development of scientific and technical talents' salary should be established, with the traditional manner of salary discarded based on post and administrative level. For example, considering dual careers, scientific and technical talents cannot only obtain the space for their own advancement, but also for the developing direction in accordance with their conditions.

**4.2.2** Rationally confirming the position levels, introducing market prices and improving the internal and external equality of salary. Internal equity is a feeling of fairness of salary in the mind of internal employees, compared with other internal employees in the enterprises. The external equality means the competition of the salary offered by the enterprises, compared with others in the industry, especially the competitive ones.

The rational position levels need to be confirmed via further job analysis and evaluation in oil fields; the basic salary of scientific and technical personnel is fixed according to the post requirement on the basis of the market price of salary, which enable the scientific and technical talents to obtain the universal benefits from their property rights of human capitals, improving the internal and external equality of salary.

**4.2.3** Consummating the performance appraisal systems, meeting the requirements of scientific and technical talents on salary. Consummate the performance appraisal systems combining the salary system, and provide the scientific basis of salary distribution. Fulfill the salary requirement of scientific and technical talents externally and internally, focusing on rewards first and motivation second so that great contributors obtain both fame and financial benefits.

**4.2.4** Gradually adjusting and consummating the welfare systems for scientific and technical talents. Integrate the welfare of money and non-money, and

make a certain compensation and embodiment to the contribution of scientific and technical talents through special welfare system.

The items of monetary welfares should be simple and fine, which can meet the main requirement of scientific and technical talents without overloads to the enterprises; regarding the non-money welfare, the enterprises can offer the complimentary welfare (complementary retirement allowance and medical insurance), paid holidays and low price houses etc based on the situations of enterprises. Strengthen the attraction and stimulation of salary system through the welfares to attract and retain technical employees for enterprises.

**4.2.5** Increasing the training effort, and enlarging the training extension. Training is not only an important access to improve the technique and creativity of scientific and technical personnel, but is also an important component to enhance the competitiveness for petroleum enterprises. Each step of the technical breakthrough can advance the further progresses of the development of the petroleum enterprises. It can be concluded that training is a double winning investment, which cannot only improve the quality and capability of scientific and technical talents, but can also increase the production efficiency and benefits for the enterprises. The enterprises can offer partial or complete training outlay, which can enlarge the scope of training in scientific and technical talents without overload to the enterprises.

Indeed, the enhancement of the managerial efficiency is not only dependent on the measures above. Such enhancement also needs a good external environment from many aspects such as corporate culture and policy etc to advance the science of salary system internally and externally, exert the human capital's values of scientific and technical talents in maximum, improve the working enthusiasm along with the creativity and attract and retain the key technical talents!

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