Analysis on the Incentive Mechanism of State-owned Enterprises' Science and Technology

Wang Han¹, Tang Guangrui²

¹ Researcher, State Grid Energy Research Institute Co., Ltd., Beijing, China
² Researcher, State Grid Energy Research Institute Co., Ltd., Beijing, China

Abstract. At present, with the acceleration of technological innovation, state-owned enterprises have become an important driving force for technological innovation in China. However, due to the limited influence of state-owned enterprises on their inherent systems, the innovation vitality of scientific and technological personnel needs to be improved. In the implementation of the country's implementation of innovation-driven development strategy, many state-owned enterprises have combined their actual conditions, dared to take steps to reform, explored technological innovation mechanisms and strategic changes, and introduced a number of new scientific and technological innovations.

1. Instruction
With the continuous establishment of the global value chain division of labor system, the competition between domestic and foreign companies has become increasingly intense, and companies are in urgent need of continuous development to improve their overall strength and international competitiveness. The importance of incentives in today’s corporate development is self-evident. Enterprises should pay full attention to the interaction between their own quality and the external environment, and combine the external environment and experience to select the right incentive mechanism for the enterprise so that the enthusiasm, initiative and creativity of the company's managers and employees can be fully realized and behave in the market competition. The cycle of self-development.

2. Scientific and Technical Personnel Characteristics Analysis
Scientific and technical work is a special work that emphasizes both basic academic research and innovation and technology research and development. Its own exploratory, creative, long-term nature and unpredictability of results determine that those engaged in scientific and technological work must also have other Industry workers have different qualities. In the dual role of job requirements and their own qualities, the motivation of scientific and technological personnel often has a certain degree of particularity and typicality. Generally, they exhibit the following characteristics:

2.1. Strong achievement and growth motivation
Most of the scientific and technical personnel have high academic qualifications, high scientific research capabilities, and strong sense of responsibility. For relatively simple and low-level material needs, they often have persistent pursuits of scientific and technological achievements and professional accomplishments. There is a strong demand for self-actualization. Higher motivation for achievement. They also value their own social status, their concern for others' opinions about themselves, and their demand for more respectable spiritual needs such as reputation, prestige and honor. Therefore, science
and technology personnel will tend to engage in more challenging and creative work to reflect their own value and obtain their spiritual satisfaction.

2.2. Strong independent sense of independence
Researchers generally have a strong ability to innovate, which means they tend to have an autonomous work environment, emphasize self-guidance at work, and want to be more involved in all kinds of decisions related to themselves, and sometimes the result is that the team is not harmonious enough. The independent autonomy of scientific researchers needs to be effectively maintained on the one hand to ensure that scientific researchers can complete their own scientific research under relatively objective conditions without interference, and on the other hand, they need to be appropriately guided so that they can effectively play in teamwork. The advantages of every researcher.

2.3. The need for fairness is outstanding
Due to the special nature of scientific research, researchers generally have higher sensitivity and insight, and have a deeper understanding of things. Therefore, they often conduct multi-angle and multi-factor in-depth analysis when judging the rationality of an event. At the same time, they are good at observing qualities and provide a considerable basis and a solid foundation for their analysis. Therefore, they are fair. More sensitive. Once they find that the results of the analysis are not fair enough or they cannot meet their expectations, they will have a great psychological gap, and thus have a sense of distrust in their own ability, system design, or the attitude of the appraisers.

2.4. The need for knowledge update is outstanding
Knowledge is the survival skill of R&D personnel. With the ever-changing technology in the industry, R&D personnel must continue to learn in order to ensure that their skills concepts and behaviors are adapted to the requirements of technological innovation. For the personnel in corporate research units, the company's development strategy and goal orientation also have a strong guiding role in the direction of scientific research work. Researchers must constantly update their professional knowledge, adjust their knowledge structure, and keep abreast of company development trends to ensure that they have made achievements in the research field. Research results have practical effects on the development of enterprises. Therefore, researchers generally have higher self-value enhancement needs and hope to gain greater potential and development space through various types of training and study.

3. State-owned Enterprise Incentive Mechanism
The incentives for state-owned enterprises for science and technology personnel should adopt a combination of multiple incentive methods, including economic incentives, spiritual incentives, growth incentives, and environmental incentives. All aspects must be taken into account and must not be neglected.

| Incentive method      | Incentive content                        |
|----------------------|------------------------------------------|
| Economic incentive   | Pay, rewards, dividends                  |
| Spiritual incentive  | Awards, honorary titles                  |
| Growth incentive     | Career access, learning and exercise opportunities |
| Environmental incentive | Flexible and relaxed working environment, work burden reduction |

3.1. Economic incentive
Economic incentives are mainly given through forms such as compensation, rewards, and dividends, which give full incentives to science and technology personnel for income. In terms of remuneration, it is important to establish and improve the compensation incentive mechanism linked to innovation contributions so that, under the condition of the total amount of wages, the salary distribution fully
embodies the innovative contributions of scientific researchers and mobilizes the innovation initiative of scientific researchers. In terms of rewards, classifications establish Applied Basic Research Awards, Major Invention Awards, and the above awards. In terms of equity and dividend incentives, the current mid- to long-term incentive mechanism for the company is still not sound. In the future, we should explore and design mid- and long-term incentive programs suitable for all kinds of scientific research personnel of the company, complement each other with wages, bonuses, etc., and improve the overall compensation system design.

3.2. Spiritual incentive

Spiritual incentives mainly through the award of awards, honorary titles and other forms, to stimulate the inherent sense of honor and sense of achievement of scientific and technological personnel, encourage scientific and technological personnel to create excellence first. At present, the company's main ways of spiritual stimulation for scientific and technological personnel include the selection of leading talents in science and technology, advanced workers, and awards for various types of projects. The awards are based on unit recommendations. The current selection system still needs to be optimized. The selection of scientists and technicians is not enough to participate in the process. The process is not transparent enough. The spirit of the award and the influence of the award are not enough. The actual effect of incentive innovation needs to be improved. In the future, spiritual incentives led by achievement levels and innovation performance should be strengthened, such as setting up top+ innovation awards, annual invention awards, and the best innovators, etc., and establish a scientific and reasonable evaluation index system for each award. The company's annual science and technology innovation conference was held to enhance the status of scientific and technological innovation in the enterprise. In the form of annual awards, the recognition of outstanding scientific and technical workers was increased and the vitality of scientific and technological personnel was enhanced.

3.3. Growth incentive

Growth incentives are mainly through the establishment of career development channels, and provide scientific and technical personnel with personal learning and exercise opportunities, etc., to promote the career and personal development of scientific and technological personnel. In the future, on the one hand, we will establish a rank-appropriate, transparent, and attractive technical sequence to promote ranks, establish a stable and smooth career development path for full-time R&D personnel, and enable R&D personnel to have the same development opportunities and remuneration as administrative personnel. Raise the professional pride and discourse power of R&D personnel; on the other hand, speed up the construction of the company’s knowledge management system, provide scientific and technical personnel with more channels for the enhancement of information, knowledge and skills, enhance foreign exchange, and accelerate the cultivation and growth of scientific and technological personnel.

3.4. Environmental incentive

Environmental incentives provide environmental protection for scientific and technical personnel focusing on scientific and technological work by providing flexible and relaxed working environment for scientific and technical personnel and lightening the burden of scientific and technical personnel. At present, the company's “soft” environment for the innovation and culture of the free and relaxed, respectful and inclusive culture provided by scientific and technical personnel is still insufficient. Mainly manifested as the lack of cultural atmosphere to encourage innovation and tolerance to failure; scientific research management methods are not adapted to the characteristics of scientific and technological activities; there is too much restriction and lack of flexibility for scientific and technological personnel; and in addition to scientific research work, scientific and technical personnel must also undertake a large number of transactional work and invade. Research energy and so on. In the future, we should gradually increase the autonomy of scientific and technical personnel engaged in scientific research work, reduce the work burden on scientific and technical personnel, give a relaxed working atmosphere for scientific and technical personnel, establish a cultural atmosphere that encourages innovation and tolerance to
failure, and establish a mechanism for exempting innovation failure under certain constraints. Smooth flow of foreign exchange channels to provide more opportunities for scientific and technological personnel to communicate abroad.

4. Incentive Method Selection
Considering the development orientation of state-owned enterprises’ scientific research units and implementation conditions of dividend incentives, combining the advantages and disadvantages of each incentive method, it analyzes the three dimensions of the nature of the company, the time of its establishment, and the characteristics of its achievements, and builds a selection model of state-owned enterprises’ technology-based incentives.

4.1. Nature of business
According to whether the company is listed or not, different standards are used: State-owned listed technology-based enterprises are implemented according to the Measures for Equity Incentives for Listed Companies, and unlisted state-owned technology-based enterprises are implemented according to the Interim Measures for Incentives for Equity and Distribution of State-owned Science and Technology Enterprises. Companies that do not meet the two approaches adopt other incentives than economic incentives.

4.2. Established time
It is one of the boundary conditions selected based on whether the establishment time of the enterprise is three years or not as an incentive. For the establishment of less than three years, growth incentives should be used mainly, and for the full three years, selection should be made based on whether the conditions for implementation of the “Provisional Measures for the Equity and Dividend Incentives of State-owned Science and Technology Enterprises” are satisfied.

4.3. Performance characteristics
If the enterprise has no convertible scientific research results or conversion value is difficult to verify and distribute, and the conversion rate of the results is less than 30%, dividend incentives will be adopted; if the enterprise outcome types can be transformed and valued, equity incentives can be used.

Enterprise's main business: companies and positions engaged in soft science research, their work results are not easy to transform or measure, and positions on soft science research should try their best to use post bonus incentives, combined with spiritual incentives and environmental incentives; companies engaged in hard science research And positions, should mainly use equity incentives and project incentives.

Employment methods: The formal employment personnel can use a combination of various incentive methods. For informal workers, they should mainly adopt economic incentive forms such as performance bonuses and revenue sharing. Equity incentives and dividend incentives should be mainly applied to senior management personnel. For mid-level managers, in addition to performance bonuses and revenue sharing, more incentives and growth incentives are provided.

5. Conclusion
Enterprises should pay full attention to the interaction between their own quality and the external environment, and combine the external environment and experience to select the right incentive mechanism for the enterprise so that the enthusiasm, initiative and creativity of the company's managers and employees can be fully realized and behave in the market competition. The cycle of self-development. In order to build a company incentive mechanism, we must take the forefront of the world, thoroughly study the practice of domestic and foreign advanced enterprise incentive mechanisms, absorb successful experiences, and obtain valuable "stones from other hills" to provide benchmarks for ushering in a new round of global competition commanding heights.
References

[1] Song Xinwei, 2010. An Empirical Study on Motivation Factors of Scientific Research Staff in Non-profit Scientific Research Institutions, China Administration. 2010 (07): pp. 112-115.

[2] Yao Guanli, 2015. Discussion on the Incentive Mechanism of Scientific Researchers in State-owned Scientific Research Institutes, Science and Technology Pioneering Monthly. 2015, 28(10), pp. 12-13+31.

[3] Zhou Jingkun, Hu Yongzheng, 2005. New Thoughts on the Incentive Mechanism and the Mode of Implementation of Scientific Researchers in High-tech Enterprises, Journal of Huangshan University. 2005(04), pp. 70-72.

[4] Wang Ling, 2006. How to establish and improve incentive mechanism for scientific research personnel, Agricultural Library and Information Science. 2006(11), pp. 20-21.

[5] Hu Lanfeng, 2014. Try to Analyze the Remuneration of Enterprise Scientific Researcher, Shandong Trade Union Forum. 2014, 20(02), pp. 85-86.