Current Situation and Development of Labor Capacity in Mining Industry in China

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Abstract. Cutting excessive industrial capacity is the main concern of mining industry. Reasonable labor capacity management aimed at mining industry is to accelerate its transformation and upgrading and provide a strong guarantee. In China, the development of labor capacity management in mining industry has gone through six stages. At present, we are in the transformation and upgrading stage. Now many provinces has issued the maximum number of people working underground in the company. Macroscopic labor capacity management is convenient, however, it cannot be adapted to various situations. Many researchers have done some research from its method and mathematical model. Mining workers' physiology and psychological health have also been analyzed. But labor capacity management focuses on industrial policy orientation. Labor capacity management in mining industry involves many fields. Besides that, because of mining features, different geological conditions of mining, and production conditions, the labor capacity management needs government coordination. The database should be set up nationwide and policy orientation should be formed after experts' analysis. Coal enterprises can also train special staff in charge of labor capacity management.

1. Introduction

In 2016, China's total energy consumption was 4.36 billion tons of standard coal, which accounted for 62.0% of the total energy consumption, down 2.0 percentage points from 2015; the consumption of clean energy such as hydropower, wind power, nuclear power and natural gas accounted for 19.7% of the total energy consumption, up 1.7 percentage points [1]. Delivery capacity is one of the five key tasks of supply-side structural reform. In 2016, China's coal enterprises withdrew more than 290 million tons of coal production capacity throughout the year, exceeding the annual target. In 2017, China will continue to take coal as one of the key industries to reduce production capacity, which is also the top priority facing the coal industry. At the same time, China's coal industry will inevitably face the survival of the fittest and follow the development of market rules. In view of the personnel structure adjustment of coal enterprises, improving the level of labor organization and management of coal enterprises, and making reasonable deployment of labor resources of coal enterprises are the strong backing and strong guarantee for accelerating the transformation and upgrading of the coal industry.
2. Development History of Coal Mine Employees

Under certain geological and technological conditions in a certain period of time, the underground labor assignment refers to the number of personnel working in the underground at the same time in each class, which is measured by the unit of person/class. China's coal industry began in the 1950s, from scratch, from trial to the right track, from slow progress to rapid development and then to scientific management, which experienced twists and turns. There are six stages in total. The first stage is the recovery of national economy and the "Five-Year Plan" period, in which the coal mine enterprises' labor assignment from scratch has a basis to find; the second stage is the "three-year" adjustment and the "Two-Five-Year Plan" period, which determines the status of coal mine labor assignment in coal mine enterprises; and the third stage is the "Three-year" adjustment and the "Two-Five-Year Plan" period. During the period of "Cultural Revolution", the level of labor appointment retreated greatly, and there was no management of labor assignment at this stage; the fourth stage was the recovery period of coal industry labor assignment management, coal mine enterprise labor assignment management was put on the agenda again, and played a prominent role in coal mine enterprises; the fifth stage was to accelerate the development of coal industry. The sixth stage is the transformation and upgrading stage of coal industry, vigorously promoting the scientific organization and management of labor staffing, accurate reduction of staff and production of green and efficient mining.

Figure 1. The stage of labor capacity development in mining industry in China

From 2005 to 2007, with the blueprint of Several Guiding Opinions on Strengthening the Regulation of Labor Employment Management in Coal Mine Safety Production Enterprises, the provinces formulated the regulations for the maximum number of underground workers in their coal enterprises (Table 2). However, these policies are basically based on the annual output of the mine, and do not take into account the geological conditions, production conditions and investment and other factors. They are too rigid and have poor adaptability. Coal mining enterprises can only passively accept the regulations and carry out the management of labor staffing within their framework, which is a reality for coal mining enterprises. It is difficult to apply.

3. Current Situation of Labor Reservation in Coal Mines

The commonly used methods of staff assignment are mainly according to labor efficiency, equipment, post and proportionality, etc. [2]. Generally, job assignment is the main method in coal mining enterprises. Then, according to the provisions of "Coal Industry Mine Design Code" (GB50215-2005), managers, service personnel and other personnel are determined. Proportion: 1) Management personnel account for 7%-9% of raw coal producers; 2) Service personnel account for 5%-8% of raw
coal producers; 3) Other personnel account for 3%-5% of raw coal producers. Or first calculate the
total efficiency of the mine, then calculate the total raw coal producers, and then calculate the number
of various types of personnel according to the above proportion. Although this macro-staffing method
is simple, its drawbacks are undoubtedly obvious, and it is no longer suitable for the actual production,
safety management and management needs of the current coal mine. In view of this situation, some
scholars have explored the underground labor assignment of coal mine enterprises through other
methods and mathematical models, such as the sampling method of working hours, the linear
regression equation of one variable, the networking time method, the Delphi method, the 10,000-ton
employment rate standard [8-9], the optimal scheduling model and the simulation of plant growth
algorithm.[10] It has contributed to the diversification of the research on the method of underground
labor assignment in coal mines.

Through the above research contents, we can find that there are few mathematical models and
research methods for coal mine labor assignment, mainly guided by industrial policies, but the
implementation of industrial policies may not keep up with the needs of transformation and upgrading
of modern coal mine enterprises, and labor assignment itself is a cycle of reciprocation, optimization
and rise of a past. Cheng. Because the production of coal mine enterprises involves many technical
fields, besides mining engineering, it also involves the fields of mechanical and electrical, ventilation,
transportation, measurement, drainage, mechanical processing, etc. The labor organization forms that
need to be equipped are complex, and the production conditions of different coal mines are different.
The implementation of "Eight-hour working in three classes" and "Six-hour working in four classes"
systems is specific. The different forms of shifts have brought certain difficulties to the formulation of
a unified system of labor appointment in coal mines.

4. Development Direction of Coal Mine Employees

4.1. Searching for a New Method and Mathematical Model of Labor Employment
As mentioned in the previous article, "Guidelines on Strengthening the Work of Safety Production in
Coal Mines and Regulating the Management of Employees in Enterprises" pointed out that the
standard of Labor Rated Employees formulated by coal mining enterprises should be revised every 2-3
years. Labor staffing in coal mining enterprises is a new and frequent research content. Especially in
today's transformation and upgrading of China's coal mining enterprises, some old methods of labor
staffing can not meet the needs of coal mining enterprises. This requires exploring a new method or
mathematical model of labor staffing for coal mining enterprises, combining with the existing ones.
Industrial policy orientation, to achieve really scientific labor organization and management, accurate
reduction of staff and production of green and efficient mining.

4.2. Exploring the Way of Multidisciplinary Combination
Coal mine labor staffing involves the combination of multiple disciplines, such as statistics, human
resources management, mining, physiology, psychology, ergonomics and so on. Chinese scholars
mainly focus on mathematical models, but little on the physiological and psychological research of the
working state of underground coal mine. In the hard working environment of underground coal mine,
it is not conducive to mobilizing the enthusiasm of workers and reducing labor efficiency, and it will
increase the casualties and cause serious impact. Through the study of physiology and psychology, this
paper puts forward the requirements for the quality of workers, understands the needs of workers in
different positions, correctly handles the relationship between workers, enables workers to adopt
correct attitudes and appropriate working methods, avoids contradictions and conflicts, and improves
the working efficiency and prevention of underground workers. Stop accidental casualties.

4.3. Government support is crucial
From the micro point of view, labor staffing in coal mining enterprises is a reasonable arrangement of
personnel structure in a mining enterprise, but absolutely no lack of macro-guidance of industrial
policies; and the rationality and accuracy of the promulgation and implementation of industrial policies and the direction of revision, which also requires the investigation and feedback of the whole industry on labor staffing management. They complement each other and make progress together. The coordination and supervision of government departments are indispensable, and a large number of raw data can be collected by the government, which plays a vital role in the analysis of labor staffing and the adjustment of industrial policies in coal mining enterprises.

4.4. Training the staff and managerial personnel of professional coal mine enterprises

The production of coal mine enterprises involves many technical fields. Besides mining engineering, it also involves the fields of mechanical and electrical, ventilation, transportation, measurement, drainage, mechanical processing and washing. It is also necessary to understand the Labor Law, Enterprise Management Science, Labor Statistics, Labor Psychology and Coal Safety Production Law. And other relevant laws and regulations and coal mining industry policies. Therefore, the management staff of coal mine enterprises should not only know the knowledge of human resources management, but also have the relevant specialties such as mining engineering, know the process, and know the succession relationship between various types of work, involving a wide range of theoretical knowledge, and accumulate practical experience in complex management. This requires coal mining enterprises to train special personnel for coal mining enterprises, so as to make reasonable arrangements and deployments for coal mining enterprises.

5. Conclusion

China's coal mining enterprises can learn from the successful cases of foreign coal mining enterprises. Coal mining enterprises'labor staffing involves the combination of multi-disciplines, and also need to draw lessons from the classical model of labor staffing in other industries. However, coal enterprises have their own characteristics, their facilities, equipment and technological process are not available in other industries, and their geological conditions, production conditions are different from those of foreign coal mining enterprises. Therefore, it needs the unified coordination of our government, the establishment of the corresponding database and the analysis of experts to form the policy orientation in the industry. It takes a long time to explore to achieve results.

At present, China's coal industry is in the period of transformation and upgrading of capacity, capacity removal is the means, and transformation and upgrading to green mining, diversified coal mining enterprises with sustainable development, quality improvement and efficiency enhancement are the ultimate goal. With the development of scientific and technological capabilities in China, the increasing mechanization of coal mines, the improvement of professional quality requirements for workers, and scientific management of labor assignment are the cornerstones for the implementation of new technologies, equipment and technology in coal mines in the future and the permanent development of coal industry.

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