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Economic Overhaul Mode of Steam Engine Professional Equipment in Thermal Power Plant

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Abstract: To ensure that the daily production activities of thermal power plants can produce their due effect in the production and business activities, it is necessary to carry out efficient and orderly maintenance work on the professional equipment of steam engines. However, the maintenance work of steam engine professional equipment in thermal power plants usually uses high-cost expenditures. Therefore, how to take effective measures to reduce the cost of professional equipment maintenance in thermal power plants has become a problem that needs to be solved before such maintenance can proceed. Among them, through the application of economic maintenance equipment in thermal power plants, the actual production and operation costs can be effectively reduced. Based on this, the author will analyze the application of the model of economic maintenance of steam engine professional equipment in thermal power plants.

Keywords: Thermal power plant; Turbine professional equipment maintenance; Economic maintenance mode

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1. Introduction

The maintenance activities of steam engine professional equipment in thermal power plants can effectively improve the daily production capacity of thermal power plants and improve the economic benefits of enterprises. In recent years, with the turbulence of the international situation, China's coal fuel prices have been on the rise for a long time, and China's current thermal power generation costs have also significantly increased. Therefore, to improve the production efficiency of enterprises and reduce the cost of thermal power generation, relevant enterprises must actively explore effective cost control strategies, and work out scientific and effective cost control measures for the maintenance of steam engine professional equipment to ensure the healthy and sustainable development of thermal power plants.

2. Thermal power plant steam engine professional equipment overhaul overview

Under the background of the information age, China's information technology has ushered in rapid development, and China's power generation equipment is also developing in the direction of intelligence. Simultaneously, more

advanced and intelligent power generation equipment and related equipment maintenance management work also ushered in a new challenge. Under this premise, more intelligent equipment overhaul technology has made many practitioners concerned.

In application, the old equipment overhaul mode is also unable to meet the current industry development and is gradually eliminated. To ensure that the equipment maintenance work can meet the current production management arrangements of enterprises to ensure the normal development of production and operation, the enterprises must timely innovate the equipment maintenance technology to ensure that the probability of failure is minimized during the operation of the equipment, and lay a good foundation for the daily production and operation of the power plant. Only in this way, the power plant can have a stronger market competitiveness in the society. Additionally, when carrying out equipment maintenance work, we must first clarify the purpose of the maintenance work, to ensure its efficiency.

However, at this stage, China's thermal power plant steam engine professional equipment overhaul work is in development. This work is not yet in fully in place, and there is still significant room for improvement in the practicality of steam engine equipment overhauls. Finally, at present, there is still a more serious waste of resources for the maintenance of professional equipment for steam engines in most of China's thermal power plants. To this end, the relevant enterprises should improve the degree of attention to this work, according to the actual production and operation of the enterprise, and formulate a scientific and effective overhaul plan.

Turbine equipment is a combination of several other equipment, when there is a problem with the turbine equipment, the relevant maintenance personnel will be graded into each branch of the turbine equipment, and according to the classification of the maintenance plan to ensure that the maintenance work can be carried out with the relevant maintenance content as guidance.

3. Maintenance of steam turbine

Under normal circumstances, the steam turbine needs to cooperate with other equipment to work normally, and there are two kinds of auxiliary systems. To ensure that the relevant auxiliary equipment is not affected by external adverse factors, the enterprise must take corresponding measures to improve the stability of the turbine operation. The steam turbine should be replaced and repaired regularly. Generally speaking, the normal working life of the steam turbine is 10 years. Through timely repair and maintenance, the service life of the steam turbine can be further extended based on the normal service life, to reduce the production cost. Moreover, the enterprise should carry out regular maintenance and maintenance work for the steam turbine to reduce the probability of failure in the daily operation of the machine.

In the maintenance of steam turbines, maintenance should be carried out in strict accordance with the standard operation process. The relevant maintenance personnel should effectively master the basic parameters of the steam turbine, timely check whether the running parameters of the steam turbine are normal, strictly supervise and inspect the quality of the lubricating oil, and do a good job in the daily maintenance of the steam turbine. During the testing process, if the parameters of the steam turbine are relatively stable, regular maintenance can be carried out according to the established maintenance and maintenance plan. If the parameter fluctuations are strong, it is necessary to flexibly respond according to the actual operation of the machine, and timely troubleshoot problems to solve potential safety hazards. Otherwise, once a serious failure of the steam turbine occurs, the economic benefits of the enterprise will be damaged, resulting in a short-term shortage of human and material resources, and the safety of the life and property of the relevant staff will be affected.

Therefore, before carrying out the formal maintenance work, you can reconfirm the inspection items of the inspection, according to the operation of the machine to develop a preliminary inspection program, under

the established program for a small scope of maintenance, which can reduce the loss of manpower and material resources of maintenance work, and also improve the efficiency of maintenance work. Furthermore, the relevant maintenance personnel should also do a good job of major failure solutions. When a small scope of maintenance is in the process of finding a major failure outside the plan, you can also quickly adjust the maintenance process, timely respond to different failures, reduce the maintenance process time loss, and the machine failure to the enterprise to minimize the loss.

The normal operation of the power plant cannot be separated from the work of the steam turbine. Therefore, the relevant enterprises should provide more financial support for the repair and maintenance of the steam turbine, and attach importance to the important value of the repair and maintenance of the steam turbine. The steam turbine is the key equipment in the production and operation of the power plant. Therefore, the repair and maintenance plan formulated for it should be more scientific, and the relevant staff should strictly follow the established plan when carrying out equipment maintenance. Additionally, the relevant management personnel of the power plant should always pay attention to the development of the maintenance work to ensure the normal operation of the enterprise.

4. Maintenance of the feed pump

In the thermal power plant, in addition to the steam turbine, the feed pump is also a very critical equipment. In the power plant, there are special feed pumps responsible for daily work, as well as spare feed pumps. However, no matter what kind of feed water pump equipment, it will not last too long during operation. Based on this feature, during maintenance and overhaul of the feed pump, it is essential to conduct a comprehensive inspection of both the internal and external components. This ensures that if the feed pump fails, the impact is limited by operating time and does not significantly affect the overall production and operation of the power plant.

In the process of daily maintenance and inspection of the feed pump equipment, the relevant maintenance personnel can choose a fixed time to carry out the inspection and supervise each equipment throughout the process to ensure that the maintenance personnel can obtain the operation data of the relevant equipment in time, to formulate an effective maintenance plan for the abnormal data promptly. Additionally, when installing the pump equipment in the power plant, the installation personnel need to strictly abide by the relevant installation standards, and reduce the probability of failure in the operation of the equipment through standardized installation. The operator of the feed pump should also listen to the professional advice of the installation personnel and maintenance personnel, regularly communicate and exchange with the relevant personnel, learn the relevant professional technology, to ensure that when there is a small problem in the feed pump, the operator can solve the problem by itself to ensure the normal operation of the feed pump equipment.

4.1. The basic idea

After decades of improvement, the stability and safety of the main body of the turbine equipment in China's power plants have been greatly improved. In this case, still using the traditional equipment overhaul mode, it will seriously affect the efficiency of the overhaul work, resulting in a waste of manpower and material resources. Therefore, the relevant enterprises need to carry out timely innovation and reform of the equipment overhaul work to ensure that it can meet the normal operation needs of the current enterprise.

However, due to the influence of many factors, current China's thermal power plants will be hindered in the innovation of professional equipment overhaul work. For example, the personnel of the maintenance plan do not have a comprehensive understanding of the equipment, resulting in the lack of feasibility and effectiveness of the maintenance plan, and the final maintenance work cannot meet the normal operation needs of the equipment. To

this end, relevant enterprises must actively optimize this situation, improve the efficiency of maintenance work, and provide guarantee for the healthy development of enterprises.

4.2. The implementation of strategies

To achieve the smooth development of the economic maintenance mode, the relevant staff must have a more accurate grasp of the operating data of the professional equipment of the turbine, understand the normal operating status of all the equipment, and divide the levels of different equipment to ensure the smooth development of the maintenance work. After the completion of the equipment grade division, the relevant personnel should formulate the corresponding maintenance plan according to the equipment grade standards and actively use the latest maintenance technology to understand the parameters of different models and different categories of equipment, to ensure that the maintenance work can be carried out with the normal production of enterprises have a higher degree of matching.

4.2.1. Improve equipment cognition

To achieve the smooth development of maintenance work, relevant personnel must have enough understanding of the performance of different equipment. To this end, the enterprise should strictly divide the existing types of equipment, to facilitate the development of relevant personnel to have a clear direction. If there are parts replacements during maintenance, old or domestic parts should be used as much as possible to reduce the procurement cost of parts.

4.2.2. Strengthen spare parts inventory management

When carrying out mechanical maintenance work, it is inevitable to encounter parts replacement. To this end, the relevant management personnel of the power plant should do a good job of spare parts inventory management in advance to ensure the quality of spare parts, so that the relevant maintenance personnel can quickly and accurately find the required parts in the maintenance process, to improve the efficiency of equipment maintenance work. Moreover, when the equipment has a problem and is repaired, the relevant management personnel need to timely register and back up the quality problems of the equipment and parts, so that when such problems occur again in the future, there can be corresponding problem-solving references. Finally, the enterprise should also establish a perfect reward system, for the staff who can reasonably control spare parts, the enterprise should give corresponding rewards and support, improve the enthusiasm of employees, but also let the grass-roots staff understand the importance of spare parts warehouse management, so that employees can maintain a higher degree of focus and rigor in the follow-up work.

4.2.3. Optimize the maintenance mode

To improve the effect of equipment maintenance work, it is necessary to make reasonable arrangements for maintenance work according to the actual operation of relevant equipment. In the daily production and operation of the power plant, most of the equipment is in the normal operation state, for such equipment, enterprises should properly extend the maintenance period and reduce the expenditure of maintenance costs. Furthermore, enterprises can also combine the maintenance of equipment with regular maintenance. After the failure of some equipment, other parts of the equipment can be inspected in the maintenance of the other parts, and in the follow-up skip the maintenance work of this kind of fault maintenance equipment, reducing the time expenditure of maintenance work. In the maintenance of equipment, according to the use and damage of different equipment for flexible maintenance program design, can effectively avoid unnecessary cost expenditure, to achieve the purpose of saving time and costs.

4.2.4. Take the initiative to update and transform the equipment

Under normal circumstances, when the equipment is used for a certain period, although the parts can still be used normally, the overall operating efficiency and performance of the equipment have been reduced to a certain extent. To this end, the relevant staff must take scientific and effective measures to optimize the operating performance of the equipment and improve the efficiency of daily production. For the core components in the key equipment, the import source must be selected to match it to protect the quality of the equipment parts. For non-critical parts, domestic parts can be selected appropriately to reduce the cost of parts procurement.

5. Conclusion

To sum up, using the economic maintenance mode to carry out equipment maintenance work can effectively control the cost of professional equipment maintenance work of steam engines in thermal power plants. Reducing the impact of equipment maintenance on the production of enterprises can also compress the production and operation costs of enterprises. To this end, the relevant enterprises should first clear the maintenance work of the development of ideas, according to the actual production and operation of the enterprise, combined with the level of different equipment, to develop a scientific and reasonable maintenance program, and comprehensively improve the market competitiveness of enterprises.

Disclosure statement

The author declares no conflict of interest.

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