

The Existing Problem and Solutions in Overhaul Management of Electrical Equipment in Thermal Power Plants

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Abstract: With the advancement of science and technology, the rules of thermal power plant systems are increasing by day, while the related functions are becoming more complex. Therefore, the maintenance and repair work of thermal power plant systems is also becoming increasingly important, which is Timely solving the system safety problems of thermal power plants, but on the other hand, to reduce the occurrence of safety accidents, also to significantly improve on the efficiency of electricity consumption and reduce the consumption of resources. Electrical equipment is the basic condition for the operation of thermal power plants, and the thermal power plants must increase the management of electrical equipment in order to ensure safe operation and promote economic and social benefits. At this stage, there are still some problems in the operation of electrical equipment used in thermal power plants, which leads to low management efficiency. Therefore, targeted solutions are needed to continuously improve on the management level of electrical equipment in thermal power plants.

One of the important equipment in thermal power plants is the electrical equipment, because if the electrical equipment is not operating safely, it will lead to major safety accidents. In order to meet the needs of industrial production and domestic electricity, the thermal power plants gradually use high-power electrical equipment, as high-power electrical equipment has a more complex structure and increasingly rich functions, but it also poses greater challenges to its safe operation and management. Based on this, the relevant staff should attach great importance to the maintenance management of electrical equipment in thermal power plants to ensure the safe operation of electrical equipment.

1. Analysis of the significance of the maintenance management of electrical equipment in thermal power plants

The infrastructure in a thermal power plant is the electrical equipment. The operating status and safety factor of electrical equipment have a significant impact on thermal power plants, only by ensuring the safe operation of electrical equipment that can create a good working environment for the staff of thermal power plants, and then improve on the efficiency of thermal power plants. Because Investigations and studies have shown that the scale of China's thermal power plants is developing in the direction of complexity and large units. Only by ensuring the safe operation of electrical equipment of the thermal power plants that can work normally [1]. There are certain difficulties in the maintenance and management of electrical equipment failures. The specific performance is as follows: (1) If the electrical equipment fails, it will directly affect the safe operation of the thermal power plant, reduce its work efficiency, increase costs, and serious safety accidents will occur in serious cases; (2) The electrical equipment of the thermal power plant needs to be prepared for a long time before operation, and the electrical equipment must be inspected and installed. The general electrical equipment is more complicated in principle. The larger the thermal power plant, the greater the demand for electrical equipment. In addition, different types of electrical equipment have different needs, so the relevant personnel need to take targeted solutions to their Manage and maintain, and then ensure the safe operation of its equipment, with a view to

improving the overall efficiency [2].

2. Analysis of the problems in the maintenance management of electrical equipment in thermal power plants

2.1 If the thermal power plant electrical equipment management system is not perfect

Effective management and maintenance of electrical equipment in thermal power plants is an important guarantee for the normal operation of thermal power plants, and the establishment of related management systems for electrical equipment is its basic premise. In the actual management process, the electrical equipment management system of some thermal power plants is not perfect, and the relevant persons in charge are not clearly aware of the important value of equipment management and maintenance for the safe operation of thermal power plants, leading to many defects [3]. For example, the rules and regulations related to the management of electrical equipment in thermal power plants are not perfect, some management staff are not clear about the management content, the management of electrical equipment in thermal power plants is not accurately located, and the related tools for the management and maintenance of electrical equipment in thermal power plants are insufficient, some responsible persons pay too much attention to the economic benefits of thermal power plants but ignore the important value of safe operation and management of electrical equipment.

2.2 The management personnel for the overhaul of electrical equipment in thermal power plants lack a modern management concept

The overhaul management of electrical equipment in thermal power plants in China is affected by backward technology and management concepts, etc., and the safety management concept has not been highly valued. In addition, due to historical factors, the thinking of management personnel has not kept pace with the times there is a lack of scientific and systematic in the end, and ultimately did not realize the benefits brought by the overhaul of electrical equipment in thermal power plants. Some management staff did not attach great importance to the maintenance management of electrical equipment in thermal power plants, and some maintenance management work only stayed on the surface, which seemed to be the maintenance of electrical equipment, but in fact did not analyze the specific cause of the failure, and also Failure to collate relevant data has led to a lack of scientific validity in the overhaul work. Investigations and studies have shown that the maintenance staff of some thermal power plants use traditional methods in their work methods and have not kept pace with the times, so they cannot meet the current development needs of electrical equipment [4]. For example, the information collection method is not advanced enough, so that the data cannot be effectively analyzed.

2.3 The professional level of the maintenance staff of electrical equipment in thermal power plants is not high enough

At this stage, the structure of thermal power plant equipment is becoming more and more complex. Therefore, the electrical equipment maintenance personnel are required to have a high professional level and need to master the following technologies: first, mechanical technology; second, electronic technology; third, automation technology; Fourth, electrical technology, etc. [5]. However, due to the failure to attach great importance to the maintenance management of electrical equipment, the relevant maintenance personnel did not participate in formal training and learning, so they did not master the professional technology well, resulting in operational errors, which could not be resolved in time after the failure, so the power generation Hidden dangers were buried in the later operation of the plant's electrical equipment [6].

3. Analysis of solution measures

3.1 Constantly update the management philosophy of managers, establish and improve a modern management system

The maintenance management of electrical equipment in thermal power plants involves many problems, such as management problems, technical problems, and operational problems. Among these problems, management work occupies an important position. Therefore, managers are required to constantly update their management concepts to adapt them to modernization. The basic development needs gradually get rid of the outdated management ideas caused by the planned economic system. Investigations and studies have shown that constantly updating managers' management concepts and improving existing management systems, and choosing appropriate maintenance management strategies can avoid blind maintenance problems [7]. On the basis of constantly updating the management concept of managers, establish a sound and perfect management system, such as establishing a perfect team management system, in order to avoid safety accidents; establish a registration system for electrical equipment, in order to fully understand the use and idleness of equipment, continuously improve the management quality of related equipment; make full use of computer technology to manage electrical equipment, achieve data sharing, and summarize the technical points in electrical equipment through the technology management platform. The establishment of the management system needs to be based on the overhaul of the electrical equipment of the thermal power plant, combined with advanced foreign experience, to formulate an overhaul plan, set up a supervision structure, strengthen supervision and management, and facilitate the efficient management of electrical equipment of the thermal power plant.[8]

3.2 To strengthen the safety management of electrical equipment in thermal power plants and regularly trains its relevant staff

The electrical equipment of thermal power plants has certain complexity and dangerous characteristics during operation, so it is of great value to achieve safe production. In order to ensure the safe operation of electrical equipment in thermal power plants, the staff of each department needs to be clear about their responsibilities, and the management staff needs to do a good job in the safety management of electrical equipment, and constantly improve management, only to improve the comprehensive quality of relevant staff. It can ensure the working effect of electrical equipment in thermal power plants. Based on this, regularly train relevant staff, improve their safety awareness, establish a management team, and then implement specific job responsibilities to individuals, so that each staff member can understand their job responsibilities, master skilled technology, and standardize operations in actual work. The thermal power plant can issue a safety manual to every employee, write typical equipment operation cases and accurate maintenance management methods into the safety manual, and periodically review them to improve their safety awareness. The relevant responsible persons of thermal power plants also need to formulate rewards and punishment measures, so that staff who violate the relevant regulations are subject to a certain degree of punishment. Once a failure is found, reasonable measures must be taken to avoid the expansion of safety accidents. For example, in the specific work process, through the reasonable setting of ground protection equipment, in order to improve the safety of thermal power plant electrical equipment. There are the following two systems in the thermal power plant system: First, the DC system; second, the AC system. The above two systems can ensure the normal operation of the generator and prevent the occurrence of power generation accidents. In this process, it is necessary to prevent the generator from overheating, and then combine it with the actual situation of the thermal power plant to achieve it through cooling methods, such as hydrogen cooling method and water cooling method. The person in charge of the relevant department should also pay attention to the operation and management of electrical equipment, so that the management work is effectively implemented, and then analyze the specific causes of equipment failures to prevent blindness.

3.3 Optimize the operating process and operating environment of electrical equipment in thermal power plants

The environment has a significant impact on the operation of electrical equipment in thermal power plants. Electrical equipment contains a large number of conductor materials, and the increase

in the temperature of the conductor material will cause the metal material to soften, which ultimately reduces the mechanical strength of the material. Most components of electrical equipment need to be stored in a dry environment. Excessive or low humidity will affect the safe operation of electrical equipment. When electrical equipment is operated in an unsafe working environment, the service life of the electrical equipment and the overall working efficiency will be greatly affected. In order to reduce the failure rate of electrical equipment in thermal power plants, it is necessary to understand the operating environment, the specific requirements of the integrated operating system, and to establish a good operating environment by adding other equipment to ensure its efficient operation. Based on this, the thermal power plant staff must consider the environmental factors when maintaining the equipment, record in detail the state of the equipment during the inspection and maintenance work, organize and upload the data in time, and analyze and process the electrical equipment data in time.[9]

3.4 Take reasonable management measures to repair and maintain the electrical equipment of thermal power plants

During the repair and maintenance of electrical equipment in thermal power plants, reasonable management measures need to be taken to ensure that the thermal power plant systems can operate safely. Relevant departments need to formulate a maintenance system related to electrical equipment, and put it in place, analyze the collected data, and record the data in the book. For example, when collecting data information during the operation of electrical equipment, it is necessary to statistically analyze the occurrence time and specific causes of electrical equipment failure, record the specific model and number of electrical equipment in detail, and then provide for the repair and maintenance of electrical equipment systems Data reference.[10]According to the specific operating conditions of the electrical equipment of the thermal power plant, formulate an effective maintenance plan; the transformer is one of the important components in the electrical equipment of the thermal power plant. Therefore, it is necessary to summarize and analyze the faults of the transformer. The main faults are: (1) The winding is shorted to ground; (2) Short circuit between phases; (3) Burning of iron core, etc. Therefore, it is necessary to establish a database of common transformer failures and make quick judgments after failures in order to improve the failure repair rate; strengthen the control by establishing a monitoring mechanism of the transformer status, and real-time analysis of voltage parameters and current parameters during the operation of the transformer, with a view to Diagnose and predict safety faults during transformer operation, and then reduce the faults incidence.

Conclusion

The maintenance management issues of electrical equipment in thermal power plants is (mainly due to the insufficient management system, lack of modern management concepts of management personnel, and insufficient professionalism of maintenance staff, etc.) have shown great concern from the relevant personnel, and China needs to reform its traditional systems, update management awareness, and avoid potential safety hazards.

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