

Application of Electronic Technology in Electrical Control

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Abstract: Today's social situation is that the social industrial structure is constantly upgraded and transformed, so the electronic technology has been widely used, making it gradually tend to automation, high efficiency and energy saving, as well as the rapid development of intelligent direction, to maximize the production efficiency of enterprises and the related work efficiency of electrical equipment, to help enterprises to maximize their economic benefits and promote The electric industry is developing in a more vigorous direction. In view of this, this paper first gives a brief overview of the advantages of electronic technology in electrical control, and then further explores how to apply electronic technology in electrical control. With the progress of science and technology, we have entered a golden new era of development. As an important basis for the development of the new era, power system plays an important role in the whole process of social operation. As the core component of power system, power electronic technology is mainly divided into manufacturing technology and converter technology. The development of electronic devices closely follows the development of electronic technology. The further improvement and strengthening of electronic technology will make the electrical control more effective, thus pushing the development of power system to a new height

1. Introduction

In recent years, electronic technology has achieved rapid development, which indirectly promotes the continuous development and optimization of electrical control industry [1]. As far as electronic technology is concerned, it involves many scientific fields, including digital electronics, analog electronics and automatic control technology. Through the comprehensive application of these technologies, electrical equipment can be more accurate, safe and reliable operation. Therefore, electronic technology has been widely used in power, steel and coal industries. Through the application of electronic technology, not only the operation process can be simplified, the working efficiency of the electrical control system can be improved, but also the enterprise can maximize the economic benefits.

2. Advantages of Electronic Technology in Electric Control

In terms of electrical control system, it mainly involves automatic control [2]. Automatic control means that under the condition of no human participation, the controlled object is required to perform the operation by the preset program. Due to the strong adaptability and better performance of electronic technology, the use of electronic technology can achieve more reliable, safe and stable operation of electrical control system, and effectively promote the good development of electrical control system in the future.

2.1 Improve the Performance of Electrical Control System

Today's electronic technology has made rapid development, technology is more and more mature, and performance is gradually becoming stable, which is just one of the main reasons why it has been widely used [3]. In addition, with the constant innovation of science and technology, electronic technology has also been regularly optimized and upgraded. For the use demand of electrical system, the performance can also be better met.

2.2 Improve the Adaptability of Electrical Control System

In terms of current electronic technology, it not only has strong stability, but also has the advantages of simple operation and strong adaptability. In view of the many advantages of electronic technology, it can help people to gradually rescue from the heavy task of human labor. On the basis of reducing a large number of human workload, it also effectively improves the overall operation efficiency of the electrical control system, and maximizes the management efficiency of the enterprise.

2.3 Improve the Management Efficiency of Electrical Control System

People's living standards are gradually improving, so the requirements for electrical equipment are also increasing [4]. As for many traditional electrical control systems, many problems are gradually emerging. These problems not only lead to a significant reduction in the efficiency of the system, but also bring serious equipment safety risks. In view of this, in order to minimize the possible loss to people's property and life safety, the electronic technology can be integrated into the electrical control system to simplify the operation and management of personnel to the maximum extent, so that all aspects of the work can be carried out more smoothly, so as to effectively improve the management efficiency of the system.

3. How to Apply Electronic Technology in Electrical Control

With the continuous advancement of electrical control system in electronic technology, it is gradually developing towards more automation and intelligence. Therefore, more and more technicians hope to further optimize the structure of electrical control system by continuously introducing advanced electronic technology, so as to make the system develop towards a more stable, reliable and safe direction.

3.1 Application in Soft Switch Control Device

Nowadays, electrical control system has been widely used, so it has higher and higher requirements for its work efficiency and electromagnetic compatibility. Not only that, people also hope to be able to reduce the space occupied by the electrical control system as much as possible under the condition of normal operation. Therefore, only by making the system more convenient and miniaturized can it be consistent with the development goal of "cost reduction and efficiency increase". For the traditional power control system, in order to reduce the occupied space, the staff usually adopt the methods of compressing transformer, using filter inductor or or controlling the capacitor accessories through switch, etc., but these methods will also lead to a lot of functional loss and greatly reduce the working efficiency in the case of reducing the occupied space. Serious even lead to a lot of extra electromagnetic interference, which has a serious impact on the normal operation of the system.

Through the combination of electronic technology and soft switch device, the above problems can be solved, and will be more in line with the requirements of today's electrical control system. Once the switch of the new electrical control system is more than 1MHz, it will make the resonant circuit reach an ideal working state. Therefore, the soft switch control device still has obvious advantages such as good system performance, low equipment loss and obvious working effect, even in the way of parallel connection and series connection of various circuits.

3.2 Applied in Current Protection Device

In the electrical control system, the circuit protection device is particularly important. Once any link of the whole system breaks down or has problems, which leads to over-current situation, the safety of the whole system can be ensured through the current protection device, so as to avoid irreparable heavy losses due to circuit damage. With the electronic components becoming more efficient, automatic and miniaturized, the traditional circuit protection device has been unable to meet the needs of modernization. By introducing electronic technology into the over-current protection circuit, it can realize the real-time monitoring of the current in the circuit. Once the

electronic technology detects the over-current in the circuit, it can timely drive and adjust the circuit, and then carry out the power-off processing, and finally achieve the purpose of effective protection of the circuit system. For example, when the bridge arm interlock protection method is adopted, once the over-current phenomenon is detected, the system will immediately send the signal of active cut-off drive, so as to effectively protect the whole power and its components.

3.3 Application in Static Var Compensation Device

Nowadays, people's demand for electricity is increasing day by day, so it is necessary to meet people's demand for electricity and ensure the safety and stability in the process of electricity consumption. In the process of actual power grid operation, the frequency may change, which will seriously affect the reliability, stability and efficiency of power grid operation.

Through the application of static var compensation device based on Electronic Technology in power grid system, as shown in Figure 1, the effect of continuous adjustment, no mechanical switch and long service life can be achieved. On the one hand, the device can keep the voltage stable when the low frequency oscillation occurs in the circuit; on the other hand, it can also increase the relevant factor of the load, so as to effectively avoid power loss and achieve the purpose of effectively improving the use efficiency. In view of this, through the application of electronic technology in the static var compensation device, the requirements for the electrical control system can be realized and people can use electricity more reasonably.



Fig.1 Static Var Compensation Device

3.4 Application in Hvdc

Nowadays, most power plants are basically output AC voltage, but the actual transmission will inevitably lead to functional loss. For this kind of loss, it is not only difficult to control effectively, but also need to invest a lot of capital cost. In view of this, under the influence of modern science and technology, many power plants begin to gradually try to adopt the mode of DC transmission. With the DC transmission technology based on the power technology, the DC power can be transmitted to the substation under the condition of large capacity, high voltage and long distance, then transformed from the substation into an AC telephone, and finally the transformed AC voltage can be directly transmitted to the user, and the specific working principle is shown in Figure 2. In this way, it not only reduces the power loss problem that may occur in the transmission process to a large extent, but also provides residents with better power consumption services.

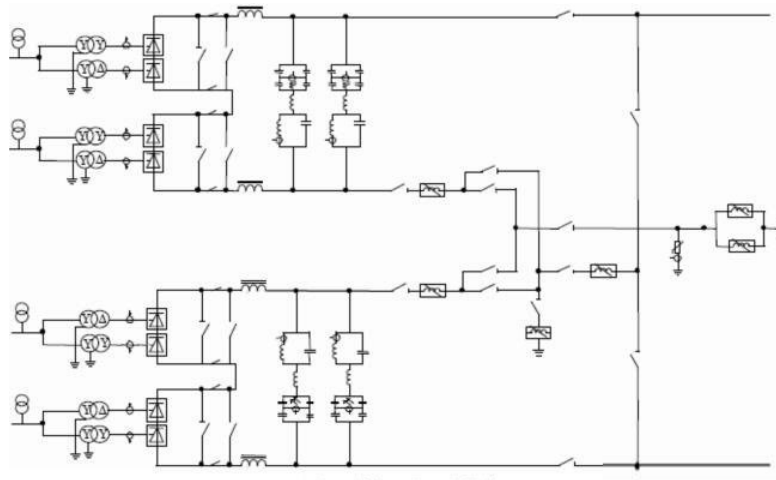


Fig.2 Working Principle of Hvdc

3.5 Application in Apf

By using electronic technology to design active power filter, all compensation elements in the circuit system can be analyzed and detected, so as to obtain equal component harmonic current. Then, the equal component harmonic current and the opposite current generated by the compensation device are complementary, and finally the equal component harmonic current is detected. The specific work flow is shown in Figure 3. Through the above methods, only the fundamental current exists in a circuit, avoiding the generation of harmonic current in the circuit. The device has the characteristics of high speed, strong anti-interference ability and some supplementary functions, which can minimize the impact of grid impedance on the circuit system.

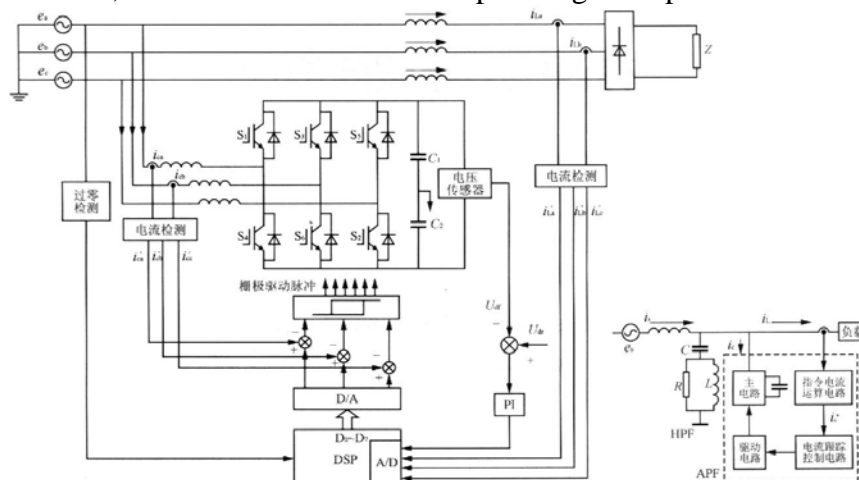


Fig.3 Working Principle of Active Power Filter

4. Conclusion

With the rapid development of social economy and electronic technology, the electrical control system has also been effectively developed. This reform not only meets people's higher demand for modern products, but also changes people's life and work style to a large extent, and promotes the development of various industries.

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