

Research on Present Situation and Technical Improvement of High Voltage Electrical Test Equipment in Substation

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Abstract

There is a great demand for electricity in life and production with the development of economy, the development of industry and the acceleration of urbanization in China. The staff of the substation should check the high-voltage electrical equipment in the substation regularly to ensure the normal operation of the substation in order to ensure the normal power supply of the substation. High-voltage electrical experimental equipment is the main means to check the electrical equipment parameters of the substation. It is necessary to carry out preventive experiments on high-voltage electrical equipment, and check the running status and hot state of high-voltage electrical equipment. We should prevent more accidents that can be avoided but can not be avoided, reduce the economic losses of enterprises, and reduce the impact of dose reduction on the normal life of residents. This study analyzes the present situation and importance of high voltage electrical experimental equipment in substations in China, and expounds the common methods and improvement methods of high voltage electrical experiment.

Keywords

High voltage electrical; experimental equipment; present situation; technical improvement.

1. Introduction

High voltage electrical equipment is an important part of substation. As a prerequisite for the normal operation of the equipment, the equipment needs to have good insulation and heat resistance. In addition, the most important function of high voltage electrical testing equipment is to test the performance of electrical equipment, which is a normal work in substation operation. The frequency of equipment failure is reduced and the reliability of substation power supply is improved through this detection. As a consequence, the detection technology should be improved to ensure the normal operation of the substation in the development of modern substation.

2. The necessity of developing High Voltage Electrical Test

Effectively testing the insulation and running state of the equipment can detect the safety of the electrical components of the power system in the whole process of the operation of the high voltage electrical test equipment. The problem can be found in time and correct and reasonable measures can be taken to solve it. As a consequence, the test can become the basis for the normal operation of electrical equipment. In the meanwhile, it can be found that the main cause is the damage of line insulation through the analysis of the fault causes of high-voltage power network, which leads to all kinds of line faults. In terms of fault prevention, the technical capability of high-voltage electrical test equipment in China is still in its infancy. As a consequence, the professional and technical personnel of our company should strengthen the

technical renewal to ensure that the insulation of the high voltage electrical test equipment is well protected, so that the equipment is always in the best running condition.

The operation safety of the substation can be checked through the electrical test when ensuring the normal operation of the power substation and the power system. It can not only ensure that the data of the substation is in the standard state, but also check whether the indicators in operation are normal. In the analysis and detection of all kinds of data, the problems existing in the substation are accurately identified, improving the operation efficiency of the substation. At the same time, the technology of high-voltage electrical test equipment can also help staff to fully understand and grasp the actual operation of the substation. It can not only reduce the probability of accidents, but also provide good maintenance time for maintenance personnel.

3. Present situation of High Voltage Electrical Test equipment

High-voltage electrical experimental equipment is a tool for the experiment of substation electrical equipment. In addition, its main function is to find the shortcomings of substation equipment in time, carry out effective protection and avoid major accidents so as to ensure the normal operation of substation equipment. In addition, the relevant personnel have a better understanding of the functions of substation equipment and improve their protection level with the help of electrical experimental equipment, shortening the protection time. However, in view of the development of substations in our country, most of the main electrical experimental equipment is still the traditional high-voltage electrical experimental equipment. These devices have some shortcomings more or less, which are mainly reflected in the following aspects: (1) The experimental processing can not reach the level of automation and intelligence. This not only consumes manpower, but also is prone to operational errors. (2) The equipment does not develop in the direction of simplification and is very large, which will inevitably cause more trouble in the process of transportation and installation. (3) Manual accounting can only be used in data analysis. However, modern information technology can not be selected for analysis, which constantly affects the accuracy of accounting and work efficiency. (4) The working ability of the experimenter is not good, and it is easy to make mistakes, which will eventually affect the experimental results. (5) The data obtained from the experiment can not be preserved for a long time. However, if it is saved, it needs to be recorded by the staff manually. It consumes manpower, and it is difficult to query the data. However, the traditional high-voltage electrical experimental equipment also has its advantages, that is, the cost is very low. As a consequence, in modern power enterprises, most of them choose the traditional high-voltage electrical experimental equipment. At this stage, it is impossible to completely eliminate these traditional equipment. The most useful method is to improve these equipment and technologies to meet the needs of modern power enterprises and career development needs.

4. Common high voltage electrical test methods

4.1. DC withstand voltage test method.

We can judge the fault of line joint through DC withstand voltage test method. If no open circuit problem is found, only two sides of personnel are needed to test. One person is connected and one person is checked. Besides, the test can be started only after confirming that it is correct. However, it is important to note that the microammeter should be shielded properly during the working period. If the capacity of the subject is small, a wave capacitor can be used. When using the microammeter, it is necessary to ensure the safety of operation and prevent the occurrence of leakage points.

4.2. Individual loss test.

The dielectric loss test connects the shielding core of the high-voltage wire to the port of the measuring equipment by wiring, and connects the core to it; The core can be connected to it, so as to avoid the aging of the insulation medium in the reverse wiring.

4.3. Resistance test.

Resistance test is also the most widely used experimental method to detect whether the internal leads and connection wires of the measuring coil are normal, and to investigate the short circuit, open circuit and so on. During the test, the DC resistance is introduced through the lead end to test the resistance of each switch. If there is a DC resistance, there will be a neutral point. When using the bridge, it is necessary to make sure that the wiring is correct, turn on the power supply, and judge whether the bridge current detector is balanced or not in the direction of the pointer. It should be noted that the data can not be read until the resistance is stable, otherwise there will be errors.

5. Technical improvement of High Voltage Electrical Test equipment

5.1. Pre-test inspection.

Conducting inspection of the device. If there is a safety hidden danger, it should be replaced in time to ensure the normal operation of the equipment. It is necessary to ensure that the test instrument is in the initial state and the preparatory work is completed before starting the work. Ensuring that the high voltage equipment is kept within a safe distance. Checking whether the tester shell is well grounded to ensure the reliability of the grounding.

5.2. Testing the operating rules.

Formulating concise call passwords, and mastering them skillfully before work to ensure that they can respond quickly during work. The operation shall be carried out in accordance with the prescribed steps. If there is a discharge phenomenon, it should be tripped quickly. In the event of personal injury accidents, effective measures should be taken to deal with them. Abiding by the relevant rules and regulations. Because the high-voltage electrical test has a certain degree of danger, all work should comply with the operating standards.

5.3. Strengthening the technical training of the test personnel, and the operator plays a vital role in the test process.

Before starting the test, operators should be properly trained to make them aware of the dangers of their work, to ensure that operating standards can deal with problems in a timely manner in case of emergencies. As a result, the operators can adapt to the test environment in time, and objectively analyze the test conditions, so as to improve the professional ability of the operators.

5.4. The work of perfecting the risk management mechanism of power grid operation mode and perfecting the risk management mechanism of power grid operation mode can not be accomplished overnight.

Power managers need to bear all kinds of risks that may arise in the future. and put forward the corresponding emergency measures to prevent risks in the early stage of perfecting the work.

Power managers need to evaluate and control various risks in the later stage of sound work. In the actual operation of the power grid, managers comprehensively analyze and avoid risks.

Developing the actual operation of the actual power grid operation combined with the preparatory work in the early and medium term.

6. Conclusion

The modernization level of high-voltage electrical equipment has also been improved to a certain extent, and the traditional test method can no longer meet the needs of the new high-voltage electrical equipment with the improvement of the level of science and technology in our country. However, if all the equipment is updated, it needs to waste a lot of material and financial resources, which is also very disadvantageous to the sustainable development of the enterprise. As a consequence, the accuracy of the test results can also be achieved by improving the existing high-voltage electrical equipment under the condition of economic permission of the enterprise. It can not only achieve the goal of improving work efficiency, but also ensure the efficiency of enterprises and promote the healthy and stable development of enterprises.

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