ABLIATION TEST OF ULTRAHIGH VOLTAGE
SWITCH CONTACT IN PLASMA

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ABSTRACT

The pulse-discharge has been made in the air. The ultrahigh voltage switch contacts were ablated by the arc plasma. Then, we used the scanning electron microscope and the analytical balance to measure the ablated and unablated contacts. Thus, the best contacts can be sifted.

1. INTRODUCTION

Huge and complex equipments were needed for the short circuit turn on-turn off test of ultrahigh voltage switch. The cost is higher. In order to do such research we must simplify the testing equipments. Then we can reduce the test cost. For example, some people imitated the turn on-turn off character of contacts with $\text{di/dt}$ in the Weill Circuit, we made the above test with the pulse arc plasma.

2. EXPERIMENTAL

First, the high voltage storage energy capacitor bank is charged by the high voltage rectification circuit. Then the vacuum switch is turned on by the trigger and control circuit. So that, the storage capacitor bank discharges to ground pass through the vacuum switch and ultrahigh voltage switch contact.

We use the Rogowski Coil and the pulse oscilloscope to measure the discharged current.[2] The exterior pictures of unablated and ablated contacts are taken by the scanning electron microscope. The ablative quantity is measured by an analytical balance.

The experimental conditions are as follows:
3. RESULTS

We compare the ablative quantity of the different contacts, the exterior pictures and the arc time under the same conditions in plasma and obtain the following results: The burn-out proof ability of contacts that makes from Cu-W-Cr, Cu-W-Zr and Cu-W-Ti better than the Cu-W. Thus, it allowable turn on-turn off current is also greater than that of Cu-W contact when they are filled in ultrahigh voltage switch.

ACKNOWLEDGMENT

My thanks are due to Zeng De-Lin, Liu Xi-Ming, Cao Xin-Zhai, Wang Duan-Ming and Liu Cun-Hua who helped me with my experiment.

REFERENCES

Fig. 2 Oscillogram of discharge current.

Fig. 3 Scanning electron microscope photograph of unablated Cu-W-Cr contact.

Fig. 4 Scanning electron microscope photograph of ablated Cu-W-Cr contact.