OPERATING CHARACTERISTICS OF INSULATORS IN WET CLIMATE

by

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ABSTRACTS.

This thesis is a study of the characteristics of insulators in wet conditions. Investigation was made at the High Voltage Laboratory, Faculty of Engineering, Chulalongkorn University. Usually , most of high voltage insulators are exposed to all climatical conditions, such as mist, dirt, heavy rain and sunny weather etc. This testing has been done under rainy conditions, including the effects of rate of precipitation, size of rain drops, angle of falling, water resistivity and the time after application of rain. The artificial rain was obtained from the constructed spray apparatus. The pin type and suspension type of insulators were used in the experiment. The dry flashover voltages at ambient temperature were also carried out in order to compare with the results of wet flashover voltages. The results showed that the large size of rain drop, high rate of precipitation and low resistivity of water decrease the ability of insulators to withstand high voltages.

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INTRODUCTION.

High tension power systems are now being developed and extended in this country. Many equipments are used in the electrical power system, but insulators are the most common ones. Even though the cost of insulators an a transmission line is a small portion of the total investment its importance should not be overlooked. Insulation failures due to poor quality may effect the stability of the entire power system. In designing a transmission line, the characteristics of insulator have to be considered carefully.

The insulator for outdoor installation must be made to withstand all normal atmospheric conditions for example, excessive deposites of salts, dust, chemical gases, heavy rain as well as hot sunny weather. Therefore the voltage testing of insulator under these conditions should be made. In fact it could not be done because it is too expensive. The investigation are therefore usually confined to dry and wet tests, which can be done in a laboratory. The flashover troubles on a transmission line due to the decreased insulation of insulator always occur. In order to solve this problem the voltage testing of insulators under artificial rain are carried out . Rain test has been done for years, and most countries have specifications for testing. Naturally, the climatic condition in Thailand is different from those countries. Owing to the characteristics of the actual rain

are not the same for all countries, the questions are therefore arise whether the specifications which have been given in those countries are valid for the conditions in Thailand. Therefore the characteristics of insulator under the climatical conditions in Thailand were investigated in this thisis.

For convenience the pin type insulators are denoted by P - 1, P - 2, P - 2.2, P - 3 and the suspension type insulators are denoted by S - 1, S - 2 and S - 3. These specifications, however are described clearly in chapter IV.

The results of this investigation on insulators might be useful or give some idea to ones whose work is concerning with the high voltage power system .