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## "Measurement of air breakdown Voltage and Electric Field Using Standard Sphere Gap Method"

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configurations.

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Abstract- Rapid growth in power sector of nation has given an opportunity to high voltage engineers to protect the power equipment for reliable operation during their operating life. There are several studies conducted by power engineers to check degradation of insulation i.e., quality of insulation of power equipment. Various phenomena occur in Air dielectric when a voltage is applied. As the high voltage power equipments are mainly subjected with spark over voltage causes by the lighting strokes, switching action, a protective device is used for determine the safe clearance required for proper insulation level strongly conducting spark formed during breakdown, practically produces a short circuit between the electrodes.

The sphere gaps are commonly used for measurements of peak values of high voltages and have been adopted by IEC and IEEE as a calibration

Index terms- power equipment, degradation of insulation, sphere gaps, peak values of high voltages etc

## **I-INTRODUCTION**

In Electrical power system, high voltage (HV) power equipments are mainly subjected with spark over voltage. These over voltage which may causes by the lighting strokes, switching action, determine the safe clearance required for proper insulation level. To avoid these problems in high voltage power equipments different electrode gap method is considered as one of the standard methods for the measurement of peak value of AC voltages. This method is used for measuring breakdown strength of Air. The sphere gap method is not complex and the accuracy is acceptable. This method is done in high voltage power networks because it have following advantages like magnitude of current will be small, power loss will be less, it will reduce the voltage drop at line impedance and transmit power at high voltage it should give better voltage regulation.

II-BREAKDOWN VOLTAGE OF INSULATING MATERIAL In insulating material valence electrons are tightly bonded to their atoms. However, insulators cannot resist indefinite amounts of voltage. With enough voltage applied, any insulating material will eventually succumb to the electrical "pressure" and electron flow will occur. An insulator is also called as a dielectric, is a material that resists the flow of electric charge. These materials are used in electrical equipment as insulators or insulation. Their function is to support or separate

Insulation co-ordination Selection of the dielectric

strength of equipment in relation to the operating

voltages and over voltages which can appear on the

system for which the equipment is intended and taking

into account the service environment and the

characteristics of the available preventing and protective

voltage for different types of electrode arrangement for

different gap distance. Further to compare the behavior

of electric field in different electrode configurations such

as sphere-sphere, rod- rod and plane-rod and compare

encountered in most of the designs of high voltage

equipments. The knowledge of the field helps to determine the insulation type and their strength to protect the equipment to perform efficiently and avoid failure.

In this papewr we have to find the breakdown

These configurations

are

electrical conductors without allowing current through themselves. Breakdown voltage is known as a characteristic of an insulator it can defines the maximum voltage difference that can be applied across the material before the insulator conducts and collapses. Breakdown voltage is also called as the "striking voltage". The



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