COMPARISON OF PROPOSED ARC MODEL FOR POWER CIRCUIT BREAKERS AGAINST THE CASSIE MAYR'S MODELS

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UNIVERSITI TEKNOLOGI MARA

MOHD OZAHIR BIN MAT PALAL
FACULTY OF ELECTRICAL ENGINEERING
UNVERSITI TEKNOLOGI MARA
40450 SHAH ALAM, SELANGOR
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ABSTRACT

This paper address the possibility of designing and describes a comparison between Mayr's and Cassie's arc models and proposed model during contact separation of circuit breaker by using Matlab Simulink. This design of the propose model has been simulated in MATLAB Simulink. The design of proposed model successfully made. Through the simulation made, simulation results of several contact separation time, arc voltage, time interval of arc and post arc current zero was determine. This result found and compare to the Mayr's and Cassie arc model. This project it is a successful because if compared to exist model, the results approximately close from the proposed arc model.

Keywords:
Circuit-breaker, Arc Model, Mayr's arc , Cassie's arc

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CHAPTER 1

INTRODUCTION

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The arc is generally defined as a continuous luminous discharge of electricity across an insulating medium which is changed into a conducting medium due to a huge number of free electrons and ions. The arc was firstly studied concerning interruption capabilities of circuit breakers, in which arc models were initially introduced to enhance circuit breaker testing. Using arc models, the capability of arc quenching can be predicted and design enhancements can be achieved with a lower number of experimental tests. Therefore, the time is reduced and the technical and economical problems of the experimental tests are overcome. The arc models have been recently modified to study the performance of arcing faults in different voltage levels and to test their detections and their discriminations. In power systems, when a circuit breaker tries to interrupt the flow of current in a line, the system reacts in a way which tries to maintain the current flow. As the breaker contacts separate an electric current flows across the contacts, through the surrounding ionized medium. This phenomenon is called an electrical arc and it occurs at extremely high temperatures. To accelerate the process of arc extinction and current interruption the insulating characteristics of the medium are optimized and the arc may be extinguished by a gas blast. Arc interruption can be described as a transient during which an ionized conducting medium is changed into an insulating medium. MATLAB is a well-known and popular general-purpose mathematical program. Since the introduction of the Power System Blockset (PSB) , the MATLAB program is also a suitable tool for the computation of power system transients. In this paper the proposed arc model is introduced. The aims are to simulate the arc in the SF_6 circuit breaker, from the high-