SIMULATING TRIPPING CHARACTERISTICS OF CIRCUIT BREAKERS USING LEAST SQUARE METHOD

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ABSTRACT

Fault studies analysis an important part of power system analysis. The magnitude of the fault currents depend on the interval impedance of the intervening circuit. Fault current will be the problem in the network system which is it can damage the equipments. Fault studies are also used to obtain the rating of the protective devices. By using the protective devices, fault current which occurs at all bus will detect in the few second.

"Simulating Tripping Characteristics of Circuit Breakers Using Least Square Method" is propose to overcome the fault problem occurred in the electrical network system. This project is to describe the relation of rated fault current and tripping time in different circuit breakers performance. The rated fault current of a circuit breaker is the maximum current a circuit breaker can safely interrupt. The tripping time setting of a circuit breaker relates to the performance of the circuit breaker over a period of time. It defines the ability of the breakers to remain closed for a time interval under high fault current conditions. It is important to understand the performance of the specific devises in order to apply it properly.

The analysis of balance fault will develop by MATLAB software version 7.6. This project is improved by the programming codes with including the design of formula equation from all circuit breakers data. All the fault currents at the fault bus and the tripping time of circuit breakers can be obtained automatically when execute the complete programming.

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CHAPTER 1

1. INTRODUCTION

1.1. LITERATURE REVIEW

The fault analysis usually might be the problem in the power system network. The components structure in power system network consisting by generators, transformers, bus bar and also transmission line. The magnitude of fault currents depends on the interval impedance of generators combining with impedance of the intervening circuit. The component can be the one of the causes of the fault problem. Statistics collected indicated that faults occur in power system due to insulation failures, flashovers due to lightning, physical damage or human error and the remaining 10% by miscellaneous causes such as falling object on the components [1]. A power system is not static but changes during operation such as switching ON or OFF of generators and transmission lines and during planning such as addition of generators and transmission line. Sometimes, fault may also cause either short circuit to earth or between live conductors, or may be caused broken conductors in one or more phases [2].

Normally, most of fault current analysis does not highlight the calculation of protection circuit includes in the electrical systems. Fault analysis without considering the protection will damage the components and also the whole system. Reliability of the operation is necessary to clear the fault because it can be effects in extensive damage to equipment, danger to personnel and disruption of services.

Fault studies are also used to obtain the rating of the protective devices. The higher fault levels recover by circuit breakers, so that fault current detector sometimes used [2]. This project is to analyze the ability of circuit breakers to detect the fault and how fast the circuit breaker will trip the circuit. This protective device must be fast