

**PERFORMANCE OF PROTECTION DEVICES AGAINST TRANSIENT
OVERVOLTAGE DUE TO LIGHTNING**

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ABSTRACT

Lightning strike is a phenomenon where atmospheric discharge of electricity which usually occurs during monsoon season and frequently during heavy rain storm. The lightning strike which is called impulsive transient can produce short-duration transient on power distribution system. Often, a lightning strike induced surge on power line causes damage to equipments especially machine and electronics components. The main objective of this project is to compare the performance of protection devices against transient overvoltage due to lightning strike in selected monitoring location at UiTM Shah Alam distribution system. There are two types of protection devices that will be considered; MOV using IEEE proposed model and transient voltage surge suppression (TVSS). A lightning surge model has been used to represent the lightning strike to be injected to the distribution system. For the completion of the project, PSCAD software will be used to simulate and analyze the output waveform. PSCAD software is a program that has been widely used and popular among electrician to simulate all kind of power system related especially on transient study. The waveform output will then be analyze and compared their performance when against lightning strike. Hence, both protection devices will be discussed since both has advantages and disadvantages.

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CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

The effect of lightning strike in power distribution has been introduced in this chapter. The limitation of work in this project will be discussed through the explanation on how the project has been implemented. Finally, this chapter will illustrate and provide a clear understanding on the completion of this project.

1.1 BACKGROUND STUDY

In most tropical countries, lightning activity is high especially in Malaysia compared to other countries. According to the meteorological department [1], almost 80% of lightning discharges current to the ground in Malaysia exceed 20 kA with potentials approaching 50 – 100 MV and 50% of strokes in Kuala Lumpur exceed 36 kA. Lightning occur when occur when the ambient temperature is high and the air is humid. The strong electric field initiates discharge inside the cloud, and a negative stream of electrons emerges as a dim spark called a stepped leader or dart leader. The stepped leader reaches close to the earth's surface, reaching an upward positive leader, and forms the main channel. The main channel carries initially a discharge current of a few hundred amperes up to 100 000