REDICTIVE MODELING INTERNAL FAULTS OF POWER TRANSFORMER

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ABSTRACT

This thesis presents the predictive modeling internal faults of power transformer with respect to the impact of the failure to the transformer. The successful development of this thesis is based on simulations using PSCAD/EMTDC software.

Firstly a model of single phase distribution transformer with internal winding short circuit faults was design by using PSCAD/EMTDC software. The types of winding faults are considered is turn-to-ground fault. The flux leakages of winding are used as the phase variables. The flux leakage variation is obtained from equation [1]-[3] covering the full operation range of the transformer with the winding short circuit faults.

Then after design the transformer, source will be applied to the transformer and the simulator tool allows varying of the transformer for the purpose of evaluating the behavior of the transformer under the turn-to-ground fault. By having the simulator tool, transformer analysis can be simulated for any type of configuration without having to perform laboratory experiments. For that purpose, this thesis presents the development of the transformer model using digital simulation software.

The purpose of this project is to design the dynamic models of the behavior transformer in distribution power system network and examine power transformers through impact of the failure by designing a model that can be used to perform a simulation using the software, PSCAD.

According to the title, "Predictive Modeling of Power Transformers," the impact of the failure will predicted after the complete design tested in the PSCAD software. The result of this test will be showed on computer when PSCAD run the simulation of the transformer.

This test is very useful because in a real distribution system cannot be tested because it will damage the equipment and the transformer. Due to higher cost of transformer, so that this thesis will help to reduce the cost in the power system by do the testing using computer software to predict the impact of the faults of the transformer when

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CHAPTER 1

INTRODUCTION

1.1 Principles of Power Systems

An understanding of basic design principles is essential in the operation of electric power systems [4]; figure 1.1 shows a one-line diagram of a typical electrical power generation, transmission, and distribution system.
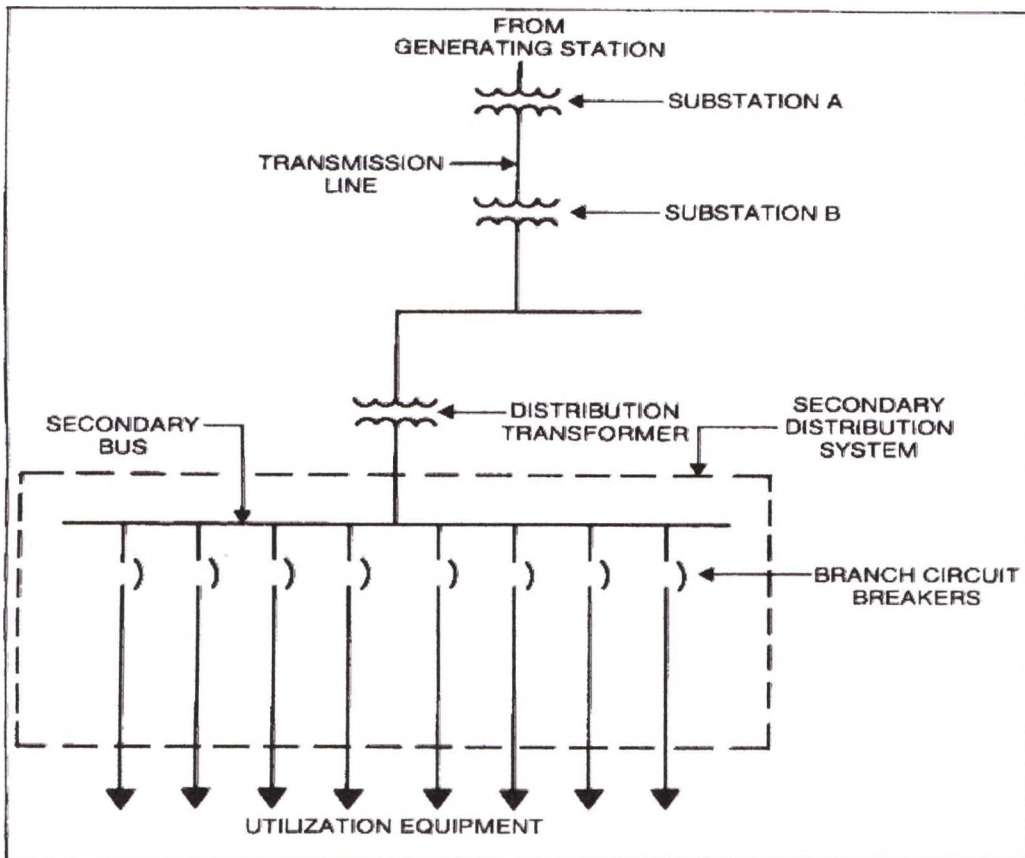

Figure 1.1: Typical Electric Power Generation, Transmission, and Distribution System.