CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

This chapter will explain about materials and method that been used to design solution. The problem statement, the physical and computational domains of study will be clearly defined. The governing equation used for this simulation, the computational method and the solution procedure will also be described. There were 24 test cases for mesh independent study with linear flow and 24 test cases for the effect of changing Re number on the flow characteristics. All these test cases had been computed on acer Travelmate4730 Intel(R) Core(TM) 2 Duo processor. The operating system of this personal computer is 64-bit Windows 7 Professional with 2.0 GB RAM. Overall there were 48 test cases for study.
To solve problem of instability magnetizing process of semi-circle coil winding that occurred to the current process.

Phase 1: Problem Identification

- START
- Collect Data
- Analyse
- Problem Identification
- Review on various of current solution applied in industries
- Discussing with experts
- Mechanical Design
- Electronics and Electric Design
- Programming
- Parts fabrication
- Parts assembly
- System testing
- System validation by company
- Approved?
- END

Figure 3.1: Phases of the methods applied to do thesis
3.2 PHASES DESCRIPTION

PHASE 1: PROBLEM IDENTIFICATION

The task was given to solve the problem of the instability of magnetizing process of semi-circle winding machine that occurred caused by the current technique that applied at production line. The first phase of the task is to identify the problem that lead to the problem. The first step is to collect data from the production line. To enter the production line, the permission is needed. The data collected involve the data of production rate per hour, data of the rejected unit per hour and the data of operators. The data collected then analysed to obtain what actually happen on the production line. It takes a lot of discussion with experts, and redo the collecting data to confirm the problem. Once the discussion were finalize, the problem statement will be declared and the solution will be thought in the second phase.

DATA COLLECTION IN PRODUCTION LINE

Details of the considerations was done to satisfy all of the forces needed and required, possibilities and its safety. There are many possibility of force in winding process such as when workers want to pull the wire, to make a turn and to clamp the unit.

FORCE

This force were obtained through the testing both of winding processes done. The testing were severally done and the force observed were recorded. The average force finally calculated by summing all values obtained divided by number of testing done.

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\text{Average Force} = \frac{\sum \text{Forces}}{\sum \text{Number of Testing}}
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