CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Six sigma is a system of practices originally developed to systematically improve processes, by eliminating the defects. The defects are defined as units that are not members of intended population. Since it was originally developed, six sigma has become an element of many total quality management (TQM) initiatives. Six sigma is a registered service mark and trademark of Motorola, Inc. Motorola has reported over US $17 billion in savings from six sigma, as of 2006. Other companies using this technique are Honeywell International (previously known as Allied Signal) and Raytheon and General Electric (introduced by Jack Welch). In recent times six sigma has been integrated with the TRIZ methodology for problem solving and product design.

A process that is six sigma (six sigma process quality is considered as world class quality) will yield just two instances of non-conformances out of every billions opportunities, provided there is no shift in the process average, and the same process will yield 3.4 instances of non-conformances out of every million opportunities with an expected shift of 1.5 sigma in the process average. A process at four sigma levels (considered average process) is expected to yield 63 instances of non-conformances for every million opportunities, without a shift in process average and 6210 instances of non-conformances with a shift in the process average. Contrary to the above, a process at the two signal level is considered a poor quality process and is expected to yield 308537 instances of non-conformances with the shift of 1.5 sigma in the process. The data for the process at different sigma levels are given in Table 1.1.
Defect values in the Table 1.1 suggest that as the sigma level goes up the defect rate reduces, which means the product quality improves. Six sigma, therefore, is a powerful tool that can transform defect prone business/industry into an organization of perfection. Thus a journey toward sigma level means a journey toward making fewer and fewer mistakes in everything.

Process capability (Cpk) is very important in order to achieve a better sigma. In recent years, Cp and Cpk indexes have become very popular as a measure of process capability in relation to the specification requirements. In other words, Cp and Cpk create more interest today than all other types’ indices. The Process Capability is a measurable property of a process to the specification. Two parts of process capability are measure the variability of the output of a process, and compare that variability with a proposed specification or product tolerance. The output of a process is expected to meet customer requirements, specifications, or engineering tolerances. Engineers can conduct a process capability study to determine the extent to which the process can meet these expectations. The ability of a process to meet specifications can be expressed as a single number using a process capability index or it can be assessed using control charts. Statistical process control defines techniques to properly differentiate between stable processes, processes that are drifting, and processes that are growing more variable.
1.2 PROBLEM STATEMENT

Nowadays, many companies want to improve their output and productivity to achieve their yearly target by eliminating some causes and production time that affect profit for company. In the manufacturing process, there are so many defects that can affect the profit of the business. The manufacturer must minimize the defect during the production of the product so that the profit of the business can be improved and the production cost can be minimized.

Aircoil lead frame welding consist of welding fixture, frame welding, and aircoil that is made of cooper. The main problem for this product is the welding is not 100% covered the area. So, the main purpose of this project is to find the effective way on how to make sure the resistance or this spot welding is 100% covered of the area and at once the product will follow customer requirements.