



# CHAPTER 1

## Introduction

This chapter is the introduction of overall research. It contains background of this research, statement of problem, objective and scope of this research, research procedure and expected result.

### **1.1 Background**

The logical way to overcome the problems associated with the manufacturing process is to apply preventive techniques at the operation stage to ensure that the product is produced to the required quality. Due to all of the manufacturing processes are affected by multiple factors such as machines employed, materials used, methods provided, measurement taken, and the people. If all of these factors are in consistency, then the process will be in statistical control. Statistical Process Control (SPC) is a tool used to measure and analyse the variation in any process. Using does not eliminate all variation in the processes but it does something that to make process to be consistence and improved.

#### **Common and Special Causes.**

Shewhart [1927] identified that there are 2 types of cause of variation common and special cause.

Common cause variation is one which contained within a natural process. This variation is inherent in the process and requires fundamental action to reduce it.

Special cause variation is the one which outside the system or process and be seen as an additional variation.

SPC allows workers to separate the special causes of variation from the natural cause of variation (common cause) found in all processes. After the elimination of special causes, there will be only common cause, then the process will be identified whether it is in statistical control.

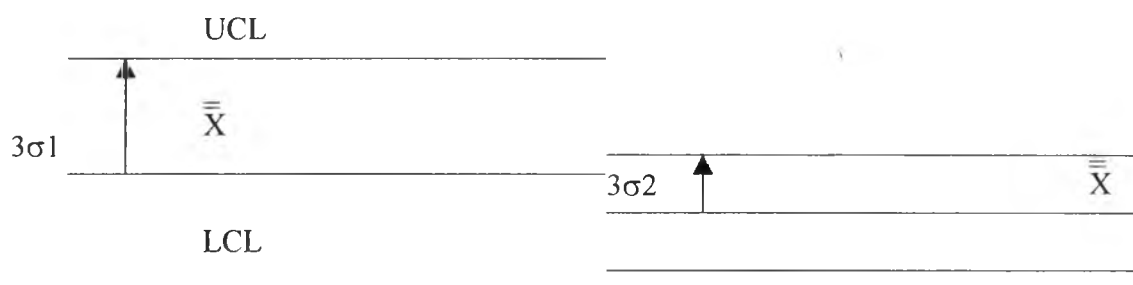
## Control Charts.

A control chart is a graphic comparison of process performance data to compute “statistical control limits” drawn as lines on chart. This is used for determining the difference between common cause and special cause variation, or to see that the process is in control or not. The main objective of using control chart is not to achieve a state of statistical control but to reduce variation.

The control chart distinguishes between common and special causes of variation through its choice of control limits. When variation exceeds the statistical control limits, it is a signal that special causes have entered the process and the process should be investigated to identify these causes of excessive variation.

### 1.2 Statement of problems

Currently, the quality control system in the hard drive manufacturer uses to monitor the quality and the consistency of the production line. In the control chart, there must be the control limits that are set to make sure that the production line is in control. After using the constant control limits for a period of time, if all the data are in control, there will be the change of the control limit to increase the process capability (picture 1). The limits will be changed of the predetermine time. By using this procedure, it is not the most efficient way to control the manufacturing process



**Figure 1-1 The change of control limit**

### **1.3 Objective**

To develop control chart to be more effective by finding the most effective of time that will be used to recalculate the control limit in harddrive manufacturer.

### **1.4 Scope of the research**

The research studies only data from electric tester in harddrive manufacturer to plot  $\bar{x}$ , R control charts and sigma control chart if only necessary. The scope does not cover other sector of harddrive manufacturing plant.

### **1.5 Research Procedure**

1. Study related literature and theory.
2. Collect data of the manufacturing statistics from the factory.
3. Analyse data
4. Find the solution
5. Implement and evaluate the improvement
6. Summarize and recommend for further research
7. Prepare report and presentation

### **1.6 Expected Results**

1. The result of this research would provide the information that shows the most suitable time to change the control limit of the control chart.
2. It also gives the most efficient way to control the quality in the manufacturing process.
3. It will provide the better understanding of quality control.
4. It will be useful for further study and development.

## 1.7 Research Schudule

Table 1-1 Research schedule

Tasks/Months	January	February	March	April	May
1. Study related literature and theory.					
2. Collect data of the manufacturing statistics from the factory.					
3. Analyse data					
4. Find the solution					
5. Implement and evaluate the improvement					
6. Summarize and recommend for further research					
7. Prepare report and presentation					