CHAPTER 1
INTRODUCTION

1.1 Thesis Background

In recent decades the world market has changed dramatically and all companies around the world need to modify the way they operate in order to survive. Globalisation along with greatly improved infrastructure has produced increased competition for customers. In addition to that, customers today have higher demands for product quality, flexibility and order flow times (Stoop and Wiers, 1996).

Some of the changes can be attributed to the different ways in which manufacturers operate today. Over the past decades there has been a flood of management and manufacturing theories coming out of Japan which have been embraced by the rest of the world. Total Quality Control (TQC), Just-In-Time (JIT), and continuous improvement are some such practices. Lean manufacturing is a term first used by Jim Womack, Dan Jones and Dan Roos in their book "The Machine That Changed the World" which was a study of the production system pioneered in the 1950's by Eiji Toyoda and Taiichi Ohno at The Toyota Motor Car Company in Japan. Lean relates to the entire supply and manufacturing process and if summed up into a simple concept can be described as the removal of waste from the entire supply chain. Waste can take many forms such as:

1. Overproduction
2. Defects
3. Unnecessary motion
4. Unnecessary inventory
5. Inappropriate processing
6. Transporting
7. Waiting

Many of the losses in manufacturing are 'hidden' losses which are difficult to quantify as individually they are small and often simply accepted as part of the manufacturing

process. However, these small losses added together can be up to 15 times the direct costs for the maintenance and repair of equipment (Blanchard, 1997), a concept illustrated by the diagram below:

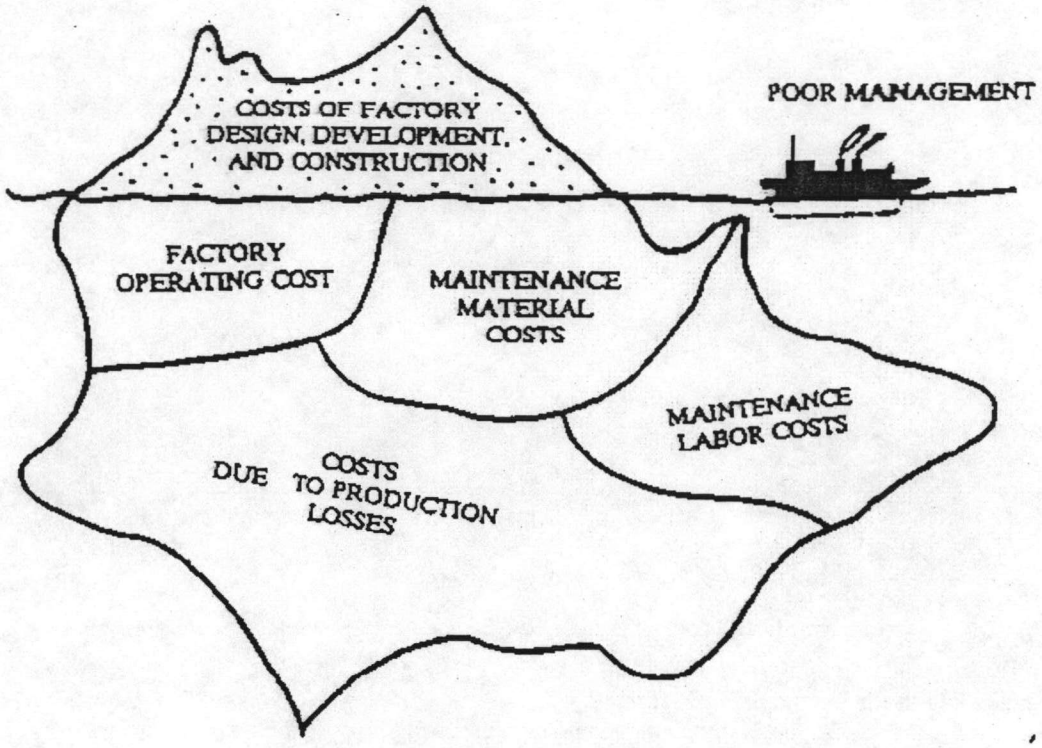

Figure 1.1: The Hidden Losses of Manufacturing (Blanchard 1997)

Some of the examples above such as waiting, transporting and unnecessary motion result in excess time being consumed during manufacturing. In the perfect scenario there would be no wasted time and therefore the efficiency would be 100%. This wasted time will be the focus of this project.

During their manufacturing processes, many companies find that they encounter 'lost time' due to some machines or workstations not operating at all times. This could be due to many reasons such as machine down time, lack of materials or waiting for bottlenecks in other areas of the production line to clear. This lost time reduces the efficiency of processes and ultimately raises costs.

Geographical Location

Thailand lies in South East Asia, an economic area that has been transformed in recent times. However, whilst foreign-owned manufacturers in Thailand have kept up to date with modern production techniques, many Thai manufacturers continue to use more traditional methods.

1.2 Company Background

The company which will be investigated is Chue Chin Hua Limited Partnership (CCH). It is part of the Chue Chin Hua group of companies which also includes The Bangkok Iron and Steel Works Company Limited, Aluminium Chue Chin Hua Company Limited, Thai-Asia Steel Pipe Company Limited and First Chue Chin Hua Company Limited.

Chue Chin Hua Ltd., Partnership is a manufacturer and distributor of the following products:

1. Steel tapered poles under the 'Crocodile' brand
2. Steel flag poles under the 'Crocodile' brand
3. Luminaires under the 'crocodile' brand
4. Highway guard rail under the 'crocodile' brand
5. Aluminium cookware and utensils under the 'Crocodile' brand
6. Aluminium window nets and slatted windows under the '3 Arrows' brand

The company specialises in the manufacture of lighting poles and is well-known in Thailand for its 'Crocodile Brand'. Established in 1936, the company started manufacturing its steel light poles in 1966, and therefore has considerable experience in this area. However, since the factory and some of the processes have been operating for a long time it is necessary to modify procedures to remain up to date on industry standards. Recently in May 2004 the company was awarded the prestigious ISO 9001: 2000.
Currently the company has a total 3 manufacturing premises totalling 224,000 metres, employing 800 people. This results in a monthly capacity of approximately 2500 steel poles which are sold mainly in Asia.

The processes that are necessary to produce steel poles are as follows:

1. Cutting of sheet- steel from coils to the required dimensions
2. Shearing of the cut steel to allow for the tapering of the pole
3. Forming of the steel to the shape of the pole
4. Welding
5. Assembly of the other parts of the pole including base
6. Galvanising in liquid aluminium
7. Finishing and adjustment by hand

The management of the company is concerned about the efficiency of the manufacturing process. The factory was built in the 1960's and was not designed to be able to produce the monthly outputs that are now needed; the size and location of the factory, the equipment used and the production methods employed may not be as effective as the modern production systems some competitors are using. These competitors have only emerged in the last 10 years and so have much more modern facilities such as automated seam welders and plasma cutters.

The production department is constantly under pressure to meet delivery dates. The forming, fabrication and galvanising stages of the production process are forced to work overtime on a regular basis to try to keep up with demand. Management has been forced to look internally at how the company performance can be improved. The recent ISO 9001:2000 award specifically states that processes have to be monitored and a policy of continuous improvement should be in place. With all this is mind it is necessary to investigate the manufacturing efficiency and reduce the lost time.

1.3 Objective of the Research

The objective of this study is to find the causes of the lost time during the manufacturing of the galvanised steel light poles and find ways to reduce this lost time.

1.4 Scope of the Research

The scope of the research includes many other manufacturers in Thailand who wish to reduce the lost time in their production processes but the research will only be applied to the particular case company, Chue Chin Hua.

1.5 Expected Benefits

When the research has been completed the company will be in a position to decide whether it wishes to change the manufacturing procedures and implement any improvements outlined in the research. The lost time could be reduced and this would help improve the company's performance. This information could be of use to other companies in the same position and even those not in the same industry market may also benefit

1.6 Research Procedure

1. Research related materials related to identifying, measuring and finding solutions to lost time in the manufacturing process.
2. Investigate the current manufacturing process and gather data that will expose the lost time at CCH.
3. Analyse the data to discover the root causes to the lost time. Combine with information in the literature and form conclusions.
4. Formulate changes that could be made to reduce the lost time at CCH.
5. Show the solutions would reduce lost time.
6. Prepare thesis dissertation and submit.
7. Thesis examination.

1.7 Guide to Chapters

Chapter 2 will contain the relevant theoretical considerations that are necessary for the study as well as contain a review of current literature regarding the subject of manufacturing time losses. This is important because it will provide a basis upon which the study can build upon.

Chapter 3 will contain details of how the research will be performed as well as preliminary information concerning the processes at CCH. This is where the planning of how the study will be shown.

Chapter 4 will be taken up displaying the results of the data collection in various forms. Preliminary calculations will also be surmised allowing further more in-depth analysis to be carried out afterwards.

Chapter 5 will be containing the majority of the analysis of the results followed by suggestions for solutions. Should these solutions be implemented in any way, further data presentation will be provided in this chapter.

Finally, conclusions regarding the success of the study will be presented followed by suggestions for further study.