CHAPTER 1

INTRODUCTION

1.1. Background

In generally, most industries can be described as production systems. These industries transform a set of supply, like equipment, raw material and labor, into finished goods. Civilization-development emerges technological development that influences into high technology. This development will make the challenge to increase efficiency and effectiveness of process. So the organization has the challenge to fulfill demand.

Production factors that have known can be grouped into intelligent or human factors, material factors and machine factors. All of these factors are used to produce from raw material to finished goods. Complexity of equipment depends on the result that they are produced. In great industry, equipment technology that used for their manufacturing process is depended on the accuracy of finished goods.

In manufacturing process and production system of a product in an industry, now used high-tech equipment to help increasing efficiency and process-productivity, so it can increase quality and quantity result.

In commonly, high-tech equipment is complex and needed a good production planning in its implementation. One of production process planning is maintenance-systems planning of production-process equipment. A good maintenance-system will

pass off smoothly that the planner wanted, because it can reduce breakdown-trouble that cannot be forecast. If breakdown-trouble has happened, it will cause much production-loss.

A good maintenance system for all production equipment also needs to be supported by a good information system. There are many types and specification of machine in manufacturing industry that each machine needs different treatment.

1.2. Problem Formulation

In manufacturing industry, particularly in big industry, usually have many problems that happened for manufacturing process. To solve these problems, maintenance division is presented. Maintenance division has responsibility to maintain capacity and quality of production.

For maintenance planning, it will need how to control and maintain all equipment. This planning will tell production-planning division about equipment status, so production-process will not go through delayed-condition or he can change to another process type.

In this moment, information is needed for maintenance jobs in many industries. In PT AMFG as a big industry that produces flat glasses, they still use this way in several periods. A maintenance work is planned from user manual from fabricator. In user-manual is written regular works period that should do and what should be done. PT. AMFG also adds some work items that feel necessary. A Yearly schedule is made from this manual. This schedule is drilled down into a monthly

schedule and drilled down into weekly schedule. A work order is made according to this schedule. After maintenance work has done, all activity will write into equipment history.

The schedule commonly is not accurate, because a work often shifts into another day. Unforeseen equipment breakdowns and work requests also come unsuspected. This condition will waste human or time resources and increase maintenance cost. It also decreases efficiency of maintenance schedule.

Productivity of labor in working-hours is decreased. It indicates overtime is always above target. Inventory level tendency becomes higher from last year. Equipment reliability and availability is also low. Maintenance Cost also has tendency high. So these problem need to be illustrated, this condition will be happened in most of industry. For instance in PT AMFG, they need to create effective and efficient working-systems for providing accurate information in maintenance systems to increase efficiency

To solve all problems above, PT. AMFG has decided to implement Computerized Maintenance Management System (CMMS). The procedures and working-instructions also are changed radically to support this system. After this system implemented, the management hopes this system can improve productivity, equipment availability, equipment reliability, stock control, maintenance costs, and safety.

In this thesis, result before and after implementation of CMMS will be analyzed. Cause of the implementation also will be discussed about equipment resource, human resource and cost. If the system cannot run as goal achievement

planning, there are still some problems. So maintenance division should correct the problem based on a proposal recommendation.

1.3. Purposes and Advantages

Now computer mostly uses only for administration work. A planner uses computer only to help his clerical job faster, but the planner still does it manually not automatically. Schedule is made in a spreadsheet program and after that the scheduled is printed and filed into a file box system. When the planner wants to update the schedule, he only gives a symbol to make sure that a job has been done. A work order also is written manually. When he wants to create a work order, he should look up to maintenance document that write in separate files. He should see what a plan-job has done or not. In the other hand, break down trouble and work request also decrease efficiency what the schedule has made.

To change this situation, maintenance division changes the system to improve this condition that can be achieved using computerized maintenance management system (CMMS). Maintenance information about all equipment that supports production function will be stored in an automated system. This system will give the information that needed in whole maintenance-working systems. When a planner estimates the labor equipment and how many times need to do a work order, he can use a 'timeslots' method. This method can be judged by benchmark jobs that everyone is familiar with. The planner also can regulate how many crafts will be needed for every job (the right men in the right job depend on their skills).

The purposes of the thesis are:

- To analyze data from before implementation and after implementation.
- To analyze the effect of this system to equipment, human resource and cost. It is much better from before or not. If not, suggestion can be given to get better result of this system.

The advantages that want to reach are:

- To justify that CMMS can increase efficiency and productivity maintenance division.
- To support the reason to improve and extend CMMS capability in the future.

As real implementation, technical data and case problem are taken from PT. AMFG as flat glass industry. The result of this thesis will give a real contribution, particularly for PT. AMFG and generally for whole industry.

1.4 Scope of study

This thesis is restricted to analyze and justify implementation of computerized maintenance management systems in Maintenance Division. Perhaps it is the most important aspect. For this purpose, the elements that support the computerized maintenance management systems have been studied. It covers human resource productivity, inventory control, and equipment.

Maintenance division does not control all maintenance activities, because production division does some of them and other divisions also do some works. Only activities that are controlled by maintenance division, especially Mechanical Department will be discussed as source of this thesis, because maintenance activity is very wide.

Company's financial aspect will be not discussed.

1.5. Thesis Structure

This thesis will be structured as follow:

Chapter 1 Introduction

This chapter contains about background, primary problem, purpose and aim, problem restriction, and structure of thesis writing.

Chapter 2 Theoretical Foundation

This chapter will explain about theory that supports thesis writing.

Chapter 3 Methodology

This chapter will explain about organization unit as study, data or information, analysis technique and hypothesis that will be done.

Chapter 4 Result and Discussion

This chapter contains about result of data processing, hypothesis test and analysis.

Chapter 5 Conclusion and Recommendation

This chapter is the end part that concludes the result and some suggestion that might be applied.