

# **Chapter 8**

## **Conclusion and Recommendation**

### **8.1 Conclusion**

Before implementing the preventive maintenance the staffs of maintenance section should be explained and trained the detail of the system and the way to follow. The new system is approach in to three major parts ass follow:

1. Document system
  - Maintenance plan and schedule
  - Job request and Work order system
  - Maintenance record and report system
  - Inspection plan system
  
2. Management system
  
3. Improve in technician quality

One of the data that used to set up the Maintenance plan and schedule can be calculate by using Mean time between failure formula (MTBF). And the steps in analyzing are as follow:

- 1.1 Gathering the data from maintenance daily reports.
- 1.2 Separated it in to each type of unit, part and individual piece.
- 1.3 Study cause of breakdown in each part and individual peace and working life of each piece.
- 1.4 Calculate the mean of working life in each breakdown piece.

After we get the MTBF number of each part, it can be use to set up the Maintenance plan and Inspection plan. But some parts have not enough data so the experience of the head of engineering department can be use to fulfills the process.

Before we can let the maintenance staffs and requester use the forms in maintenance system. The user should under stand the meaning in each part and the way to show data. The head of engineering department is the first person that must understand the purpose and advantage of the document. After that the announcement can be show to other people. The detail of announcement can begin by:

1. The detail of maintenance data form; the way to use, how to control, where the form goes and the place to keep.
2. The detail of Machine inspection card; what does it use for, how to use the form, who will use it.
3. The Maintenance plan and schedule; what is advantage of, how and who can use, who will control

From the study of the maintenance system and cause of machine breakdown of the company found that the unpredictable machine breakdown and poor in maintenance system are the two major causes of the time lose in maintenance. And it affect to the lose opportunity in production line.

The unpredictable machine breakdown, this thesis studies the cause of machine breakdown by collect the machine maintenance data in year 2001. The data is separated in to a group of unit part. In order to analyze the cause of breakdown in each part and the data is analyzed to find the average working life of each part. The average working life in each part can be calculated by Mean time between failure formula (MTBF). After we found the working life of each part, the maintenance plan can be set up. In this thesis has set up the weekly and yearly maintenance schedule. By following the schedule it can reduce the number of unpredictable machine breakdown. And the inspection plan is one of very useful to help the staff not to forget to take the correct activity to the parts. If the maintenance is made proper the unpredictable breakdown will reduce or may not happen. It will affect to the lose time in maintenance.

Poor in maintenance system, the first cause of poor in maintenance system is the head of department has over load of job to be done. It blocks him from improving the maintenance section. Second cause is communication in the section. The head of department is a foreigner and he can not read and write Thai so the boss and the technicians can communicate by talking only. It is the main reason that why the maintenance section is very poor in document system and it very hard to set up the document. The way to solve this problem is the boss and the technicians must have connector. And this person can help the head of the department to control the staffs of maintenance section. When the head of department is free he will have time to think the way for improve the section and he will has time to improve the relationship between boss and staffs. By follow the maintenance schedule the section wills have more job to do as a routine work. The increase number of staffs will take a respond in this job and can reduce the over time of each staff.

After implement the preventive maintenance at the beginning of the year 2002. It take about half year to run until it quite stable so the proper data of maintenance that can pick up to compare with the old data should be at second half of the year 2002 it during July to December. The both of summary data between before and after implement preventive maintenance are showing in table 8.1

<b>The total of lose time in maintenance in year 2001</b>	<b>442 hours: 40 min.</b>
<b>The total of lose time in maintenance in year 2002</b>	<b>264 hours: 25 min.</b>
<b><i>The reduce of lose time in maintenance</i></b>	<b><i>178 hours: 15 min</i></b>

Table 8.1: the comparison of loses time in maintenance for six months.

From Table 7.8, the company can get more opportunity in producing the product 167,168 baht in six months. This number is concentrated in only one production line and insert of chief of section and increase staff are advantage to every line in the company.

## 8.2 Recommendation

As you can see in Table 7.6, the repairing time is increasing from 108 hrs to 150 hrs. It should be considering that why the time is increasing. It may cause of low skill technicians.

Course of preventive maintenance planning, the company has to prepare the changing part. So the system for stocking is one of the following topics. If the maintenance plan is high accuracy it will be the step to start JIT in stock changing part in the future.

The maintenance data that pick up to compare is quite short term it may cause of an error. The detail of some part is not appearing in data because it does not breakdown. So the data that is good to concern should more than one year. The working life may be erroneous if the staff that changes the part has low skill.

The document system will be forgotten if every body is not keep continuously. The data may useless if the form does not fulfills or skip some detail.

Some parts of the machine are not suitable for the working environment. It will be better if the type of the part as been change.

From the conclusion show that the highest waste of time in maintenance is the waiting time for maintenance or the machine breakdown at night. Because the company has no maintenance staff at night so when the machine breakdown the user has to wait until morning. By implement preventive maintenance it can reduce unpredictable of machine breakdown but it still have. If it occurs in the working time of maintenance section it will be solve immediately. But if it occurs at night the machine has to wait. So if the company has the maintenance staffs at night, the time loss in maintenance will reduce.