CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

After implementation of quality cost program in the company, a great saving was achieved. Also, along with this program, a lot of grey areas were identified and cleared. Further more, through the implementation, the quality control tools were appropriately applied and the quality control system was strengthened.

However, as the time limitation, comparison among department, product and service was not be performed. This can be improved after the research.

However, the research can be the basis and reference for the further improvement among department, services and products.

5.1.1 Cost saving

Result for the product B as shown on table 5.1

Table 5.1 Comparison before and after quality cost program for product B

| Cost category	Before			After		
	Cost	% of total	% to sales	Cost	% of total	% to sales
Prevention	0.444	6.8	0.15	0.539	9.04 ▲	0.11 ↓
Appraisal	2.008	30.9	0.68	2.202	36.9 ▲	0.46 ↓
Internal failure	1.843	28.3	0.63	2.83	47.5 ↑	0.59 ↓
External failure	2.207	33.9	0.75	0.39	6.54 ↓	0.08 ↓
Total	6.502	100	2.21	5.961	100	1.24
Sales value	294			481.6		

Unit: Million Baht

Cost saving ratio to sales = 2.21% - 1.24% = 0.97%

Cost saving (profit increase) = 0.97% X 481.6 = 4.67 million Baht

Quality cost distribution comparison can be shown by the pie chart as figure 5.1

P: Prevention

A: Appraisal

I: Internal failure

E: External failure
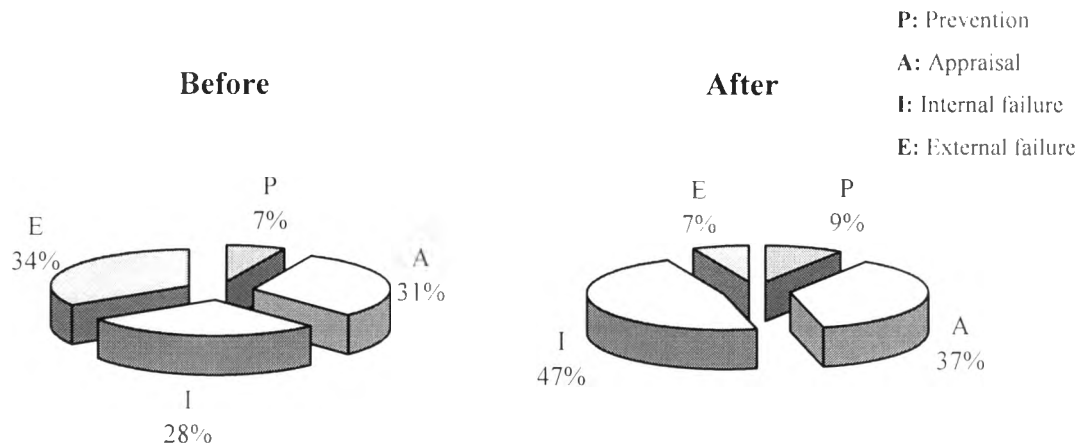
Before

After

Figure 5.1 Comparison before and after the quality costs program for product B

From above, we can conclude followings,

1. Total COQ and ratio of COQ to sales are reduced.

2. Prevention and appraisal cost is increased, but failure costs are reduced.

3. However, inside failure cost, the internal failure costs are increased. These include re-inspection, rework. In order to improve quality, we include the pilot production quantity for new product, new component, ongoing reliability test quantity. These can identify the potential problem, engineering change more often, then increase these failure costs. This is because that internal control is tightened.

4. Recall costs is also increased. This is based on the concept that we stop sending failure product to customer and rework by ourselves. Previously, we evaluate the trade-offs between the quality risk ship to customer and recall. However, a big complaint occurred. This damages the quality reputation. After quality cost program

started, the recall cost increased but the complaints from customer is reduced.

As some criteria is difficult to be assigned to confirm products, but can be calculated for all products, based on records from accounting department, QA department and IE department. The comparison for overall COQ of all models in year 2000 and year 2001 are as table 5.2

Table 5.2 Quality costs comparison between year 2000 and year 2001 (all products)

	Year 2000		Year 2001	
	Cost	Sales	Cost	Sales
Prevention	8.85		10.78	
Appraisal	15.05		17.6	
Internal failure	56.12	3,594	47.46	2,644
External failure	55.5		5.11	
Total	135.52		89.95	
Ratio to sales	3.77%		3.40%	

Unit: Million Baht

For all company, the overall COQ is reduced. If down to cost element level, prevention, appraisal costs are increased, while internal failure cost and external failure costs are reduced.

Next step, the trend should be further increase prevention cost, reduce appraisal cost, and further reduce internal failure and external failure cost.

The significant finding on the quality cost program is that it has big impact on profitability. In year 2000, the external failure cost is 94 million Baht, the profit is 108 million Baht. In year 2001, the profit improved to 154 million Baht. The high

profit in year 2001 have many reasons, but successfully carry out quality cost program is part of it.

Another gain is that significant follow - up and clear understanding of quality system. Although it can not be measured in terms of money, obviously it is valuable.

5.1.2 Why the quality cost was improved in this case study

Quality tools and techniques are assistant tools on improvement. However, its effectiveness depends on the good quality planning, strategy formulation, implementation and follow up.

From the program started, a team was formed to develop the plan and strategy. The strategy is to select certain cost element, use Pareto analysis to identify the top cost element, then use caused and effect analysis to identify the root cause. Then actions were taken to attack each item and improve on these cost

The strategy is to increase prevention cost and appraisal cost, and to reduce failure cost, but to reduce the overall cost. As the sales base is different, the ration of cost to sales is selected.

To verify the actions, the data before and after the program was collected and analysis. PDCA tool was applied on the follow up process.

Another factor contributing to quality cost improvement is the organization change in quality department. When the business grow, the quality department have more responsibility. The previous organization may not be suitable for the change. In this case study, the two managers are separated in quality department. One is specialist on quality system, another is in quality control. The clear responsibility gives a clear focus on the quality improvement.

5.1.3 Trigger on improvement

Usually a company is used to existing operating system and keep on

going. As time moves on, some methods need improvement. However, it is a little bit difficult. The quality cost program becomes a trigger on the improvement in terms of quality system and also some parts of accounting system.

For example, usually company only calculate scrap, recall cost and warranty claims. Other failure cost such as customer complaints, it may take many resources, but they may be hidden from the management.

Quality cost program is a tool to identify such cost and come to management's eyes. Immediately this will draw attention and will become triggers for the improvements, if appropriate quality cost program is launched.

5.2 Discussion

5.2.1 The project leader is the key on implementation

Like other project, the project leader is the key. The leader must be capable of co-ordination, guidance and follow up. Therefore, the selection of the leader is important. For this project, the leader is from IE function, not from typically QA department. This has three reasons,

1) The leader need have more authority to report top management also can lead / push the team on action. Also, the leader can have enough time to guide and lead the project.

2) IE can quickly be trained on the quality cost and can handle the data collection and reporting.

3) IE has already had some necessary data. Therefore it is more easier to expand the database.

5.2.2 Balance on data collection, analysis and reporting

One of the key activities on quality cost program is data collection, analysis and reporting. This activity exists the balance on data accuracy and cost to achieve that.

To achieve that, the selection method of data collection and handling is important. Only the major should be kept and these affect little bit should be removed.

5.2.3 Obstacle from management

During the program implementing, it is observed that mostly some management people refuse the change and refuse the new concept. This obviously affects the program implementation. In contrast, the staffs show great support on the program.

Therefore, before the program start, how to get all managers have some direction is another important issue.

5.2.4 Continuous program

This thesis concentrates on one model, on some cost elements only. Obviously, this is only a part of quality cost program.

To achieve this, continuous implementation and follow up need be performed.

5.3 Recommendation

5.3.1 Database system set up

Quality cost needs many data. Data handling is one of the key areas on quality cost program.

To save manpower and improve efficiency, a simple database can be developed, by using Microsoft Access or FoxPro.

With such a database, a weekly / monthly / quarterly / yearly data can be retrieved. Then these data can be compared with budget to measure how effectiveness the program can achieve. However, as the time and resource limitation,

this was not done in this project. Probably, an improvement on this can be performed after this project. The report format is suggested use the Appendix A

5.3.2 Scale of the implementation

This research is only on selected single product. However, if need get more clear picture, the comparison among product and service can be performed. As a result, the data can feedback to responsible area for further improvement.

Again, as the time limitation, this could not be performed in this research. Still, it can be done after this research.

5.3.3 FMEA application

FMEA is a tool to anticipate the potential failure, evaluate them and come out countermeasure to kill them at early stage. FMEA can be used as a technique to assist company achieving proactive continuous process improvement.

The product is designed by HQ. Design FMEA could not be performed in the manufacturing site. However the process FMEA for product quality improvement should be performed. This can prevent the failures by identifying potential failure and providing the actions against the failure in stead of frequent engineering change. It also can feedback the design related problem to HQ from this point of view, we can say FMEA implementation is also a process to prepare trouble shooting and preventive maintenance requirements.