

CHAPTER V

Results, Conclusions and Suggestions

5.1 Results

From the implementation of the solution as suggested in the Chapter 4 on the MP Hotel Project (Job No. P135/97), the results showed improvements in the following areas:-

1. Delivery Schedule
2. Project cost variances
3. Project cost estimation method

1. Delivery Schedule

The improvement in the delivery performance can be attributed to several changes made to the way the company handles its projects. Some of the key factors which led to the improvements in the delivery time, and the subsequent commissioning of the kitchen project were as follows:-

1.1 Reduction in the number of raw material shortages

Since the type of materials, and their quantities required to fabricate the equipment for the project are known in advance, the timing of their procurement could be planned and carried out appropriately, so that enough materials are always ready for the production. From the records gathered from the Production Planning and Control Department, as well as the Store personnel, using the "Shortage of Materials Report" form, the material shortage problems of the New Bangkok Hotel and the MP Hotel are compared in Table 5.1 below.

| | The New Bangkok Hotel | MP Hotel |
|--|-----------------------|----------|
| No. of equipment in project | 152 | 105 |
| No. of equipment encountered parts shortages | 20 | 1 |
| % of equipment w/ part shortages | 13.16 | 0.95 |

Table 5.1: The before and after effect of the improvement programme on material shortages.

1.2 Better Project Coordination

The introduction of the Project Manager post, as well as his team, saw the better management in the kitchen project works. Besides having appropriate authorities to make project related decisions, the new project management team also helped to coordinate and relate critical information to the Production and Installation Department, and thus promote smooth working conditions for both Production, and Installation Department. This fact is reflected in the Table 5.2 which showed the amount of non-conforming equipment that were manufactured and/or installed as a result of miscommunications between departments. It is observed that, through better communications as well as proper monitoring and control of the project activities by the project management team, such error in the project can be reduced.

| | The New Bangkok Hotel | MP Hotel |
|---------------------------------|-----------------------|----------|
| No. of equipment in project | 152 | 105 |
| No. of Non-conforming equipment | 15 | 2 |
| % of Non-conforming equipment | 9.87 | 1.90 |

Table 5.2: Amount of Non-conforming equipment from communication problems.

Since the improvement of the above mentioned factors have direct impact on the production and installation schedules, the reduction of material shortages, as well as the better coordination

between the department concerned enable the Production and Installation Department to meet their targeted delivery date.

2. Project Cost Variances

After having revised the BoMs of the standard equipment, and established a new purchasing policy by negotiating prices of certain major raw materials with the suppliers, the prices for the equipment could now be estimated to a better accuracy than before. This means if the Production Department is committed to the BoM used for cost estimation, and the amount of labour-hours used in the manufacturing, and installation of the equipment in the project could be controlled, the actual prices of the equipment should turn out to be fairly close to that of the estimated ones (barring from any unforeseen event). The reduction in the differences between the estimated prices and the actual prices are reflected in the summary of direct costs as shown in Table 5.3 below:-

| Production | The New Bangkok Hotel | MP Hotel |
|----------------------------------|------------------------------|----------------------|
| Local Equipment | | |
| Average DM Variance, % | 38.62 | 3.31 |
| Average DL Variance, % | 24.78 | 8.59 |
| Average Overhead Variance, % | N/A | 56.16 |
| Local Equipment variance, % | 35.45 | 11.51 |
| Imported Equipment | | |
| Average Variance | 7.97 | -23.38 ¹³ |
| Total Equipment Cost Variance, % | 22.53 | -0.42 |
| Installation | | |
| Average Variance, % | -106.32 | 9.04 |
| Total Project Cost Variance, % | 17.39 | -0.24 |

Table 5.3 Production and Installation Variances Comparison

¹³ The devaluation of the Thai Baht resulted in the lost of money on the Imported Items for the MP Hotel.

3. Project cost estimation method

Besides the improvements made in the monitoring and control aspects of the project implementation phase, by including all the relevant cost elements to the new project cost estimation method as described in the previous chapter, the project costs could now be estimated closer to reality than before. This was confirmed by the lowering of the project cost variances as shown in the previous Table 5.3. Since all the direct costs (materials, labour, and variable overheads) can now be calculated with better precision, and the other fixed costs, which make up the other part of the product cost, could be obtained from the Accounting Department, the company could now estimate the break-even point of the project better than before. By knowing the cost position of the project, any decisions regarding the company's pricing strategy could be done with more confidence when going into a bid.

5.2 Conclusions

The application of the new project planning and cost controlling system to the MP Hotel project did show improvements over the traditional way of handling project works. These achievements could be concluded as follows:-

1. A turn-key kitchen project could be completed as scheduled, barring from any unforeseen events, if:-

- 1.1 A pre-bid project plan is done beforehand, so that the company would know if it has the capacity to take the project or not.

- 1.2 The information from the Bill of Materials of each equipment in the project could be used to make material requirement

planning; so as to prevent their shortages, and thereby reduce the likelihood of delays.

1.3 Lastly, but perhaps the most critical key to success of any project, is the person in-charge, i.e. the Project Manager. Since project work involves working with many parties, both internal, e.g. Design Department, Sales, Production, and Installation, and external, e.g. customers, main contractor, mechanical and electrical (M&E) contractors, as well as other contractors, the communication between everybody concerned is very important in getting the work done as smooth as possible. The Project Manager helps to coordinate and relate information to the party concerned, and in the process, reducing the chance of miscommunications which could result in the delays. Also, by granting enough authority to the Project Manager, the PM could make important project-related decisions at the job site right away, and thus preventing the delays due to unnecessary bureaucracy.

2. The reduction of cost variances

In bidding for a project, not only is it important to pay attention to the capacity of the company in handling the job, but the price offered to the potential customer is also equally, if not more, important. Too high of the offered price usually means losing the bid, while too low of same means low profit, if any. Hence, if a realistic cost of a project could be worked out, the company could use its pricing strategy in order to win the bid. Thus, the reduction of the variances between the estimated and the actual costs is vital to a successful bid. Some improvement made to the existing practice which helped to make the project cost estimation more realist were:-

2.1 Updating the Bill of Materials

The Bill of Materials must, first of all, be updated so that they are as close to the actual usage as possible, especially in the Standard Equipment. In doing so, the materials usage for each equipment could be better controlled during the requisition for production and installation. Also, by agreeing on the more realistic BoMs, the workers themselves would be more aware and committed to the amount of materials they use.

2.2 Price Agreements with Suppliers

The price agreement schemes are worked out with the suppliers of the raw materials so as to reduce the uncertainty that might occur between the time of quotations and the time of ordering. By raising the confidence of the Purchase Department that they would be able to buy the materials as committed to the Estimator, the need for cost overestimation is reduced.

2.3 Controlling of the Labour-Hours Usage

Besides making sure that the cost estimated for a project would reflect the actual costs as close as possible, one of the methods to reduce the cost variations is to actually control the time used to do the project-related tasks. Because the amount of direct-labour-hour required as estimated for each equipment were either obtained from past history (in case of standard equipment), and approximation (in case of non-standard equipment), it is very likely that the actual direct-labour-hour used would differ than the figures estimated. Anyhow, as long as the estimated figures reflect the real work required, and they are used to control the work schedule, the variations in the labour cost could be reduced. Also, since the overhead cost in the Production Department are

directly proportional to the direct-labour-hour used, therefore, by controlling the time it takes to do the project tasks, we are ultimately also controlling the overhead costs as well.

5.3 Recommendations

The study of project planning and cost control system for the foodservice equipment industry will be successful if its practice is maintain regularly. Also, to ensure continuous usage of the system, enough level of educations must be given to the people concerned, especially, the lower ranking personnel, such as Foremen and Workers; so that the information they gather are reliable and meaningful. For more benefits, this system serves as a guideline to other possibilities of further improvements in the following areas:

1. **Productivity Improvement** -- Information obtained from this study can serve as a basis for further studies in the area of productivity improvement of the job shop, which is notorious for being full of irregularities and changes.

2. **Flexible Manufacturing** -- In order to cope with ever changing demands from both the clients as well as the sales, and to handle a large number of products types such as those that the company makes, the study of flexible manufacturing system may be applied.

3. **Production Design** -- The various types of equipment as experienced in this project could also serve as a basis for further improvements to their design, particularly in the manufacturing techniques. The idea of common parts might be investigated further for faster production and installation of the equipment.