CHAPTER VIII

CONCLUSION AND RECOMMENDATION

Conclusion

This research study indicates that many energy conservation opportunities (ECOs) exist in all operations throughout the plant.

According to the historical data of 1985, the total energy consumption is approximately 357 Gigajoule per day. Electric energy accounts for only 45.49% while its cost shares nearly 79% of the two types of energy used by the facfory. The daily production capacity of the same year is about 13.3 tons. This gives the specific energy consumption of 2.019 kilojoule and specific cost of 6.76 baht per kilogram of filament product.

An energy conservation committee to handle the energy program of this factory is proposed in this study. The energy manager can play an important role in overall coordination and in directing all committee members throughout the plant. Duties for the committee and for the manager are recommended in Chapter 4.

The electrical system was investigated and found that the spinning and the take-up processes are the largest electric energy consuming areas. The equipment responsible for the production system is identified to be the group of equipment utilizing the biggest amount of electricity.

The thermal system in this study refers to that of steam production, distribution and utilization. The heat balance at the steam production portion was analyzed and it was found that the boiler efficiency was 89.6% based on the data collected in November 1985.

However, this figure should be reviewed periodically, especially when reliable measuring instruments are available, so that a better result can be achieved. The selected ECOs were analyzed and revealed the expected saving of 948,260 baht per annum.

A summary of the ECOs identified by this research is shown in Table 8.1.

Recommendation

The energy conservation program for the factory must be continued so that the energy-output ratio can be reduced to the lowest possible level while maintaining a high-quality of the filament product.

The following channels are possible for further studies:

1. Developing a measure to reduce waste occurring in the manufacturing process.

2. Optimizing the processing conditions such as temperature, pressure, cycle time, catalysts, material ratio, etc.

3. Studying the possibility of replacing all the existing steam ejectors with vacuum pumps.

4. Considering an investment on new technology of the filament production that requires less energy.

Table 8.1 A Summary of All ECOs Identified by this Study*

Item	Potential Monthly Saving, ฿	Investment Baht	Payback Period
Electrical System:			
1. Load factor improvement	16,523	none	immediately
2. Lighting control	3,386	90	12 days
Air Conditioning System:			
1. Ceiling insulation	12,232	750,000	5 yr. 2 mo.
2. Preventing infiltration (ECO 2,3, and 5)	119,396	none	immediately
3. Reduction of solar gain	45	3,400	6 yr. 4 mo.
4. Improving chilled water system (ECO 6)	9,000	8,500	1 mo.
5. Resetting room temperature	889	none	immediately
Thermal System:			
1. Reset blowdown rate	12,945	none	immediately
2. Equipment insulation	6,448	94,600	1 yr, 3 mo.
3. Piping modification	8,818	71,500	9 mo.
4. Replacing ejector with vacuum pump	24,880	78,250	4 mo.
5. Eliminating excessive equipment	25,930	none	immediately
Total	240,492		

*See the corresponding chapter for more information.