

CHAPTER 4

PROBLEM AND SOLUTION

4.1 Problem

4.1.1 Problem Identification

The company's problem is that the variation of melamine compound's curing time of the company's process is very much because the process is out of control, for example, as shown in Figure 4.1 and Figure 4.2

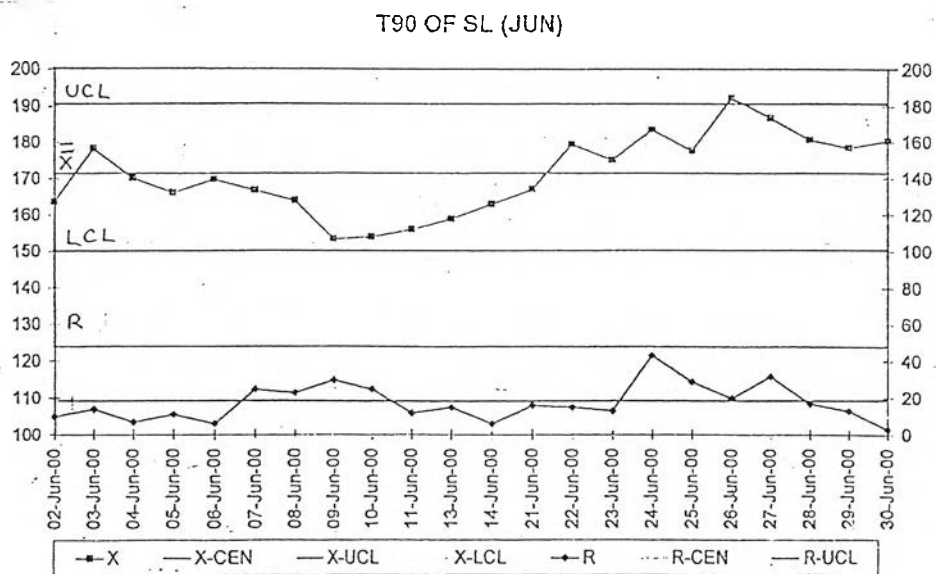


Figure 4.1 : The Control Chart for Melamine Compound's Curing Time of the Company in June 2000.

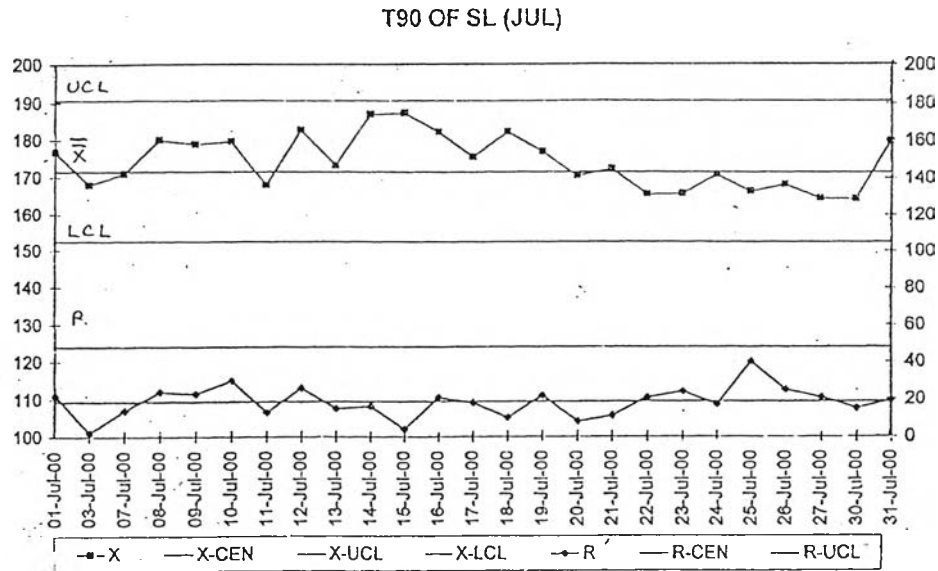


Figure 4.2 : The Control Chart for Melamine Compound's Curing Time of the Company in July 2000.

4.1.2 Cause of Problem

The company's process is out of control, but most operations in the process are normal. And most plotted points of the control charts still are within the two control limit lines because of making adjustment to the volume of curing agent type 2. Therefore, other factors affecting the curing time, which are F/M ratio, NaOH, and curing agent type 1 should be investigated.

Firstly, F/M ratio is fixed at 2.0, and a constant volume of NaOH and a constant volume of curing agent type 1 were used at the kneader. However,

there are the changes in volume of NaOH in the range of 3.1 to 3.6 liters at the reactor, for example, the company's checksheets at MC product in Appendix 1.

Secondly, the volume of NaOH used at the reactor is tested by making change volume of NaOH from 3.2 liters to 3.4 liters a reactor batch to observe the change in the curing time, and the results of the test are shown in Table 4.1.

NaOH (liters)	Observations of Curing Time (seconds)							
	1	2	3	4	5	6	7	Average
3.2	467	415	422	444	382	448	402	425.71
3.4	528	496	495	505	480	519	446	495.57

Table 4.1 : The Effect of NaOH Volume on the Curing Time.

As the results of the test in Table 4.1, a little change in NaOH of 0.2 liters results in a lot of increase in natural compound's curing time of average 70 seconds.

Therefore, the variation of the curing time is very much, resulting from volume of NaOH varied in the range of 3.1-3.6 liters in the operations of the company's process.

In conclusion, a main cause of the company's problem is the change in volume of NaOH used in each batch at a reactor of the company's process.

4.2 Solution

To solve this problem, the method of design of experiment is chosen to study factors involving the change in volume of NaOH and affecting the curing time in order to determine the suitable conditions of the factors at the reactor.

