Practical Procedure for Reducing Setup Time

In the previous chapter, we learned the importance of and need for reducing setup time—that is, using a small-lot production to shorten lead time. This chapter discusses an implementation program for reducing setup time. The program basically promotes improvement activities which reduce setup time. An organizational promotion plan for the program is described in the final section.

ANALYZING SETUP ACTIONS

To shorten setup time, it is important to first recognize the current conditions about setup actions within the plant. Although most plant managers and section heads are concerned about reducing setup time, they usually leave setup operations in the hands of floor workers. As a result, they are often unaware of the actual setup conditions themselves. Although exact timing of the current setup actions may have never been measured, workers—when asked—will guess that a setup action takes “about” two hours to two and one-half hours. The key word here is about. In reality, the setup actions are likely to be out of control. However, if management began to pay attention to setup actions and operators, and take and record exact measurements, opportunities for improvement could be identified.

The following problems may exist when setup actions are lengthy or if setup time varies greatly:

1. Setup completion is uncertain.
2. Setup procedure has not been standardized.
3. Procedure is not observed properly.
4. Materials, tools, and jigs are not prepared before setup operations start.
5. Attaching and detaching actions are lengthy.
6. The number of adjustment operations is high.
7. Setup actions have not been properly appraised.

These problems can be improved through daily investigation and repeated questioning of setup conditions at the actual work place. The following example

First, the standard operations routine sheet for all processes in the stamping section must be examined. For this example, the Daihatsu automatic tandem line (Figure 9.1) will be used. The process and standard operations routine depicted in Figure 9.2 illustrate that the following problems can arise in the stamping line:

1. Operation loads among processes are unequal.
2. Delay in the operation time for machine B-1 causes a delay in the subsequent process.
3. Opening the safety fence to exchange the T/O attachment for machine B-1 increases the setup time.

Once identified, the problem spot is videotaped for precise motions and time constraints. Alternative methods should be tested until the best alternative is identified. Once implemented, the new method should be documented on the standard operations routine sheet. The same approach should be applied to each problematic process. Figure 9.3 illustrates the sequence for researching setup actions.

**PROCEDURE FOR SETUP IMPROVEMENTS**

In addition to video taping and conducting time and motion studies of setup actions, there are four more procedures for attaining setup improvements. The first step is to separate the internal setup from the external setup. The second step is to shorten the internal setup time by improving operations. The third step is to promote further reduction in internal setup time through equipment improvement, and the fourth step is the challenge to reduce the setup time to zero. Each of these steps is detailed in sequence in Figure 9.4.