5. ASSESSMENT RECOMMENDATIONS

AR No. 1

Punch-Press Changeover Reduction

Recommended Action

The time required for press changeover currently accounts for nearly 9% of the total production time in your facility. Reducing number of changeovers by increasing batch size from 1,000 to 1,500 units will result in fewer changeovers and increased productivity. The increase in equipment utilization will result in a 3% increase in product output.

Assessment Recommendation Summary		
Cost Savings	Implementation Cost	Payback (years)
$25,650	$0	Immediate

Background

Your plant currently produces smokers in batches of 1,000 units. After each batch, dies are changed and a different size product is produced. Die changes are time consuming and labor intensive. The average time estimated by your company was approximately 5 hours per change.   Based on records collected during our visit, current output is approximately 36,000 units per year.

Each roll of sheet metal contains enough material for 1,500 smokers. By increasing the batch size to 1,500, the number of changeovers necessary to meet production would be reduced.

Implementing this recommendation would provide a way to start increasing productivity. For further improvement, we recommend streamlining the production process. This would increase production and provide a more regular schedule for workers.

Anticipated Savings

We estimated savings based on the increase in sales of smokers produced with the increased production hours made available by reducing the number of die changes. During our visit, plant staff indicated that sales could keep up with a 15% increase in production.

The current number of changes per year (CC) can be calculated by dividing annual production (AP) by the current batch size (CB).

$$CC \quad = \quad AP \div CB$$
$$= \quad 36{,}000 \text{ units/yr} \div 1000 \text{ units/batch}$$
$$= \quad 36 \text{ changes/year}$$

The proposed number of changes per year (PC) can be estimated by dividing current annual production by the proposed batch size.

$$PC \quad = \quad 36{,}000 \text{ units/year} \div 1{,}500 \text{ units/batch}$$
$$= \quad 24 \text{ changes/year}$$

The increase in available machine time (IAMT) is calculated based on the reduction in the number of changeovers multiplied by the average changeover time (CT).

$$IAMT \quad = \quad (CC - PC) \times CT$$
$$= \quad (36 \text{ changes/year} - 24 \text{ changes/year}) \times 5 \text{ hr/changeover}$$
$$= \quad 60 \text{ hr/yr}$$

The increase in production resulting from the increased available machine time is based on your current rate of production (PR), estimated in the following calculation.

$$PR \quad = \quad AP \div [OH - (CC \times 5 \text{ hr/change})]$$
$$= \quad 36{,}000 \text{ units/yr} \div (2{,}040 \text{ hr/yr} - 180 \text{ hr/yr})$$
$$= \quad 19 \text{ units/hr}$$

Assuming all increased available machine time is used for production and the current production rate remains constant, in increase in product output (IP) will be:

$$IP \quad = \quad PR \times IAMT$$
$$= \quad 19 \text{ units/hr} \times 60 \text{ hr/yr}$$
$$= \quad 1{,}140 \text{ units/yr}$$

The percentage increase in production is:

$$IP\% \quad = \quad IP \div AP$$
$$= \quad 1{,}140 \text{ units/yr} \div 36{,}000 \text{ units/yr}$$
$$= \quad 3.2\% < 15\%$$

Since your company can sell up to a 15% increase in production, we believe that the 3.2% increase from this recommendation can be sold. Savings ($S) can be calculated by multiplying the additional units produced (IP) by your profit margin (PM), which was given by your company as an average of $22.50/unit.

$$\begin{aligned} \$S \quad &= \quad \text{IP x PM} \\ &= \quad 1,140 \text{ units/yr x } \$22.50/\text{unit} \\ &= \quad \$25,650/\text{yr} \end{aligned}$$

Implementation Cost

There are no costs involved in the implementation of this proposal, as long as adequate inventory space is available. During the plant visit we were informed of plans for extra inventory space were already being considered. Therefore we assume implementation of this recommendation will not lead to extra cost. Payback for implementation of this recommendation will be immediate.