KAIZEN: A Case study in small scale organizations

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ABSTRACT:
This paper entitled “Kaizen: A case study in small scale organizations” concerns with the cost reduction by some modification in processes of small scale industries. The Paper also focuses on the improvements that can give the minimum rejection level of the products. In this paper some data’s are collected by experimenting specially in the wire harness manufacturing companies for automotive vehicles. Here are some modifications by implementing these in the same industries the quality of the products can be improved. By adapting these Kaizen techniques the processes can be made more efficient and effective.

Key words: Kaizen, cost reduction, Minimum rejection, continuous improvements

1. INTRODUCTION:
Kaizen is a Japanese word for the philosophy that defines management’s role in continuously encouraging and implementing small improvements involving everyone. It is the process of continuous improvements in small increments that make the process more efficient, effective, under control and adaptable. Improvements are usually accomplished at little or no expenses, without sophisticated techniques or expensive equipments. It focuses on the simplification by breaking down complex processes into their sub-processes and then improving them.

For the paper we have completed some experiments before and after the improvements and modifications in process, data are collected before and after modifications and on the basis of these information’s the cost and rejection levels of the products are identified. Then we did calculations on standards cost basis. After calculations some conclusions are find out that are represented with the help of graph and tables. Some examples of kaizen improvements in wire harness manufacturing companies and their effect on cost and rejections levels are shown with the graphs and tables. To find out the results the certain procedure is followed.

Procedure applied for Cost reduction:
1.Identification of problems
2.Selection of the problem
3.Objective
4.Defining the problem
5.Data collection: Before and after
6.Root cause analysis
7.Data analysis
8. Action
9.Developing solutions
10. Achievements
11.Effectiveness
12.Tangible benefits

2. IMPROVED ACTIVITIES FOR BETTER:
2.1. PROBLEM: Excessive cycle time and poor quality in resistor leg bending for resistor assembly and irrax tube cutting and slitting.

This problem is generally found in the wire harness and CDI Unit companies on small scale. After receiving, the flow diagram generally used is:
2.1.1 Identification of problem:

2.1.1.1 Modification in leg bending process:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Problem</th>
<th>Reason</th>
<th>Action</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Excessive cycle time and poor quality in resistor leg bending</td>
<td>Leg bending with nose plier</td>
<td>Provide jig for leg bending</td>
<td>Done</td>
</tr>
</tbody>
</table>

2.1.1.2 Modification in Irrax tube cutting and slitting method:

Before the improvement the tube cutting and slitting performing by scissors and using a plain scale for measuring the length of the tube but after improvement we installed a machine that can cut, slit and measure the tubes.

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>i. Tube cut length variations, ii. poor quality in slitting and iii. extra cycle time in tube cutting</td>
<td>Measuring with scale, holding by hand and cutting by scissors</td>
<td>Develop pneumatic machine for cutting and slitting with adjustable measuring gauge and provide mandrel for holding</td>
<td>Done</td>
</tr>
</tbody>
</table>
Before improvement the irrax tube cut by scissors and measure with scale but after the development of the pneumatic pressure operated automatic sleeve cutting machine this cutting can be easily performed with accuracy and for slitting there is one blade mounted in the path of cutting and to measure length there is one adjustable scale.

**21.1.3 Data Analysis:**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Operation</th>
<th>Production per shift</th>
<th>Production per hour</th>
<th>Manpower used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tube cutting</td>
<td>1600 pcs</td>
<td>200 pcs</td>
<td>01</td>
</tr>
<tr>
<td>2.</td>
<td>Tube slitting</td>
<td>1600 pcs</td>
<td>200 pcs</td>
<td>01</td>
</tr>
<tr>
<td>3.</td>
<td>Resistor leg bending (both side)</td>
<td>800 pcs</td>
<td>100 pcs</td>
<td>01</td>
</tr>
</tbody>
</table>

**Cost before improvement**

**A. IRRAX TUBE CUTTING AND SLITTING:**
Manpower cost per hour  = Rs. 28.85/Per person  
Production per hour     = 200 pcs/per person  
Manpower cost per piece  = 28.85/200=Rs. 0.15/-Approx.

**B. RESISTOR BENDING:**
Production per hour       = 100pcs  
Manpower cost per piece   = Rs. 0.29/-pc  
Note: 2 nos. of resistor and 2 nos. of tubes are used in one harness.  
Total manpower cost in sub-harness (Tube cutting, slitting and resistor bending)  
= 2x0.15 + 2x0.29= Rs. 0.88/pc

**Cost after improvement**

**A. IRRAX TUBE CUTTING AND SLITTING:**
Manpower cost per hour    = Rs. 28.85/Per person  
Production per hour       = 1000 pcs/per person  
Manpower cost per piece   = 28.85/1000=Rs. 0.029/-Approx.

**B. RESISTOR BENDING:**
Production per hour        = 200pcs
Manpower cost per hour  = Rs. 28.85/per person
Man power cost per piece  = Rs. 28.85/200= Rs. 0.15
Note: 2 nos. of resistor and 2 nos. of tubes are used in one harness.
Total manpower cost in sub-harness (Tube cutting, slitting and resistor bending)
= 2x0.029 + 2x0.15= Rs. 0.36/pc

3. CONCLUSION:
By the implementation of these kaizen activities we can save 50-60% time and cost reduction.

3.1. Tangible and Intangible benefits:
(a.) Utilization hours increased  (b.) Reduction in Manpower.  (c.) Cost Reduction.  (d.) Productivity improvement
(e.) Over time reduction  (f.) Capacity increased  (g.) Reduction in wastage  (h.) Improve in aesthetics

4. RESULTS:
The main objectives of such types of kaizen activities in the small scale industries are:
- To increase the productivity
- To reduce labor cost
- To improve the quality and customer satisfaction
- To improve the feasibilities

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