

# Engineering Change in Kaizen

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**Abstract**— Kaizen is a concept that focuses on improving a work area of an organization in incremental Steps. Kaizen is the Key to Japan's Competitive Success. This paper illustrates about kaizen case study in Larsen and Toubro Company which produce Switchgear panel. This case study is focused to reduce over burden, stress on labor. Why- why analysis, brainstorming, techniques are used for analyzing problem. Due to Implementation kaizen it increased productivity, quality, morale, safety, Delivery time and reduced the cost and stress, overburden of labor.

**Keywords**- Kaizen, Improve, Productivity, Quality, Safety

## I. INTRODUCTION

In today's modern age and everyday life, we have many actions, problems, concepts, etc. Have to face it. In today's ongoing stressful times, we face many obstacles while completing our own work and daily activities in the home or community and to solve the many problems, new ideas and plans have to be implemented to solve those problems. Since the creation of life, man has consistently tried to improve his life by using his own intellect and initially by using machines and tools. And even in today's modern age, we use innovative techniques, machines and concepts for ourselves, our family or wherever we are working. Such a presence is constantly implementing new concepts to improve the quality of the tools of sales organizations.

In the modern age where industrial competition has intensified in various countries and even in India, the use of modern technology has increased. Likewise, it is widely accepted technology in India. India has, however, developed its own technology to some extent. In the same way, it is seen that the activities of other countries, by studying the concepts, technologies and implementing them, have greatly enhanced their progress. We too are committed to implementing new concepts and solutions for the up liftment of our own family and the organization we are working in.

For example, in daily life at home or in the family, we have made the daily schedule for the body to make the right turns. When you are living your life in the home and in the workplace, Pokayoke, kaizen, lean, value engineering, value stream mapping, 5s are all concepts that you use.

Meantime, we can produce and exchange more quality products using better clutter. Kaizen means continuous improvement in functioning for example, in the past, newspapers were merely a means of entertainment or information. As well, with the improvement of radio, Television, Internet and modernity now, Kaizen's objective is to improve. As well as working at the company, we paid close attention to the kaizen technique. Stretch film wrapping fixture the first wooden fixture is used to improve the quality of the

panel while packing the panel and the metal stretch film wrapping fixture is being used to improve it. It saves time, labor and improves the packing quality.

## II. CASE STUDY

### A. (i) Coil Nail machine:

The Kaizen was on Pneumatic coil Nailer gun. The gun is used in packing area, when left unused or not operated carefully can be hazardous to operator and nearby personnel. Pneumatic operated coil nail gun is used for packing and at the time when it is on standby mode, there was chances of harmful accidents if pressed unfortunately. Also if handled carelessly it can be injurious to operator and nearby standing personnel.

The locking arrangement is prepared to lock striking plunger mechanism when not in use, so that the chances of Accidents are eliminated .It also ensures that operator operates it carefully without causing any sort of accident to himself our nearby personnel.

Implementation cost is negligible. (30 INR)  
According Pneumatic Nailer Injuries— Report on

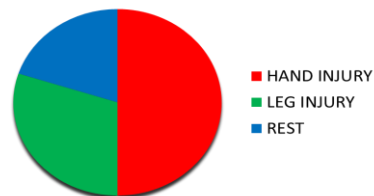


Fig.1 Washington State 1990-1998

### (II) ROOT CAUSE ANALYSIS:

The brainstorming technique is used for analysis of root cause that basically responsible for hazardous to operator.

Following root causes are observed:

1. Unfortunate misplace of gun and activation of trigger.
2. Carelessness in operation
3. Wrong orientation of gun during stand by position
4. One handed operation

Coil nail machine does not have any provision to overcome this cause.



Fig. 2 Before Coil nail Machine

(iii) Logical idea or Kaizen Idea:

Prepare spring type bracket arrangement for coil nail machine because of which trigger of Coil nail machine if left unused it will be less harmful.

(iv)Kaizen Implemented

We have proposed and made Bracket arrangement to trigger of coil nail machine because of which if coil nail machine left unused or not operated then chance of accident is eliminated.



Fig. 3 After Kaizen implemented on Coil nail Machine

Benefits and key results:

1. Chances of accidents are eliminated.
2. Provides protection during and after operation.

B. (i) Batten fixture for packing:

Panel packing up to extreme height and use of ladder and stool takes more cycle time for Stretch film wrapping process. Stretch film roll is heavy in weight and takes more effort to carry at extreme overhead height, so unevenness in wrapping occurred which further in turn caused overlapping of stretch film on one another along with its wastages and operator undergo strain further affected on productivity.

(ii) Root cause analysis:

As the initially stretch film wrapping around the panel is done manually by operator. Cycle time of wrapping of stretch film was 2min per panel and hence we failed to meet the daily production target.



Fig. 4 before stretch film wrapping.

(iii) Logical idea or Kaizen Idea:

Prepare Plus shaped portable wooden fixture is made up from wooden scrap.

(iv)Kaizen Implemented

Stretch film roll is mounted on batten fixture and wrapping of panel is done by using this fixture. By using this fixture operator can wrapped the stretch film at the height of panel without use of ladder or stool and took less efforts of operator which eliminate unnatural condition while working. Overburden and strain is eliminated of operator.



Fig. 5 after stretch film wrapping

(v) Change for betterment/Kaizen

As to overcome the problem while wrapping of stretch film manually we have prepared wooden fixture for ease of wrapping operation but sometimes due to which uneven rotation of stretch film roll takes place then as for betterment i.e. nothing but kaizen we have prepared metal fixture with scrap metal having greater accuracy than batten fixture.



Fig. 6 before and After Fixture used

C. (i) Height & width Batten

While loading of ODC panel vehicle issue occurred that the Height of Gate Door of ODC Container was less. At the time of Loading we have faced Problem and because of this unfortunately we have to reject the Vehicle.

(ii) Logical idea or Kaizen Idea:

Prepare batten gauge for height and width with definite dimension to overcome the problem

(iii)Kaizen Implemented

We have Cut Batten of required height and width Because of this we can check the Vehicle at Security gate at the time of Entry in Factory before Loading. For the Ease to labor's we have noted the required Size of Vehicle on the Batten so that anyone can work on it.



Fig. 7 after implementation Kaizen

### III. EFFECT ON COST

After implementation of Batten fixture type kaizen we have saved cost of Rs. 169 per day.

	Consumption of Stretch film (kg/160panel)	Stretch film Cost (per KG)	Cost saved daily
Before	80	130	10400
After	78.7	130	10231
		<b>Saving per day (Rs.)</b>	<b>169</b>

Tab 1.1 Cost saved daily

### IV. RESULTS

Cycle time of packing operation (Stretch film wrapping) reduced from 2min/panel to 1min/panel. Daily target achieved along with reduction in stretch film wastage. Overburden and strain of operator is eliminated and operator feels satisfied.

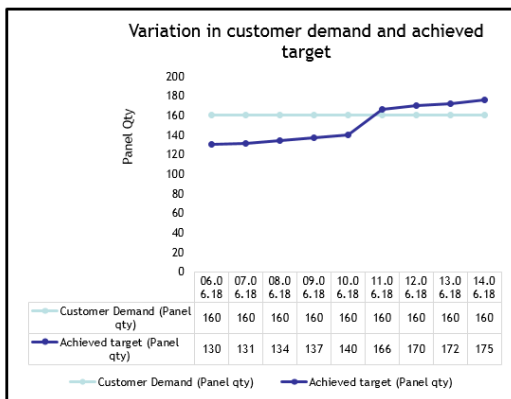


Fig. 8 Variation in Customer demand & achieved target

As after implementation of this Kaizen Material consumption is also reduced from 80 kg to 78.7 kg also cycle time of stretch film wrapping operation reduced from 2 min to 1 min per panel.

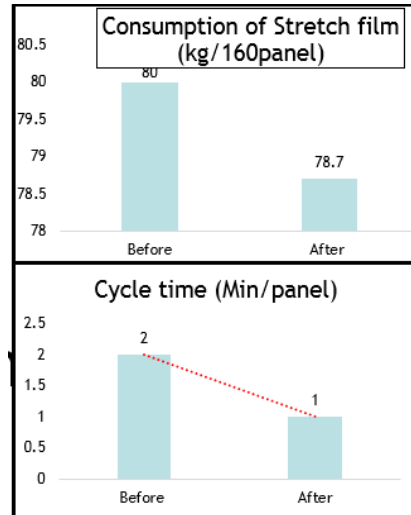


Fig. 9 Cycle time & Consumption of material

### V. CONCLUSION

1. It is observed that after the implementation of this Kaizen Productivity is increased by 50%,
2. Cycle time of packing operation reduces from 2 min/panel to 1 min/panel.
3. Morale of operator increased by relieving the strain of operator.
4. Cost Saving of Rs.169/day. Chances of accident i.e. falling from height are eliminated.
5. Reduction in Time Consumption. Delays in loading Reduced. Cost Efficient (Reduces Labor and Forklift Cost).
6. Self-protective equipment, achievement of zero accident.

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