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Reduction of Coolant Wastage using Kaizen in an Industry

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Abstract: The objective of this study is to reduce the wastage of coolant and scrap handling by applying kaizen methodology in the industry. Kaizen is a continuous improvement technique which involves each and every person of an industry. This research focused on the company, which manufactures various mechanical components. Kaizen is proven management technique that has a practical application for coolant wastage and scrap material handling in industry. This work case was conducted within 4 months started from 19 September 2017 to 19 January 2018. This significant work indicates that the study was really helpful for the industry to improve productivity.

Keywords: coolant wastage, scrap handling, kaizen, continuous improvement.

I. INTRODUCTION

At the time of World War II kaizen was created. Masaki Imai was the man who popularized kaizen to the world to become a revolution but, Dr. W. Edwards Deming the quality guru was the man who originated kaizen.

The word kaizen is a combination of two Japanese words (kai+zen), which means —Change for the Better. The kaizen method has been particularly known as the best method for the improvement in production for companies since it was introduced & the costs were minimal.

Kaizen is a system that involves everyone – upper management to the lower team. Nowadays the machines which are used by the companies are not much efficient because instead of improving productivity and saving time & money, these machines are eating coolants and producing more scrap.

The concept of kaizen mainly focuses on improving the work space step by step and eliminating the wastes. This research indicates the reduction of wastes, improvement in work efficiency & time management/saving. Kaizen is a system that involves everyone – upper management to the cleaning team.

Kaizen includes most of the quality and production improvement techniques. Kaizen has helped many SMEs to improve their production and withstand against other competitions in the market.

The companies who want to make their position in the market must use kaizen to increase the quality of services provided and cost reduction and lastly motivation to the whole staff.

II. LITERATURE REVIEW

Kaizen philosophy embraces three main principles proposed by Imai (1986) which are process orientation, improving and maintaining standard and people orientation. All principles are significant in order to implement the kaizen.

A. Process orientation

Imai stated that kaizen is process oriented.

If you want the results to be improve then firstly improve the process.

B. Improving and maintaining standard

Kaizen can be used for the small improvements of work standards. Imai (1986) said “There can be no improvement where there are no standards. If we reach achievable stage, then we must maintain for a period of time.

C. People orientation

The benefit gained after applying kaizen can be seen by the worker of the company. This principal is particularly focused on the suggestions given by the workers for the improvement in production. This also motivates them to be more productive.

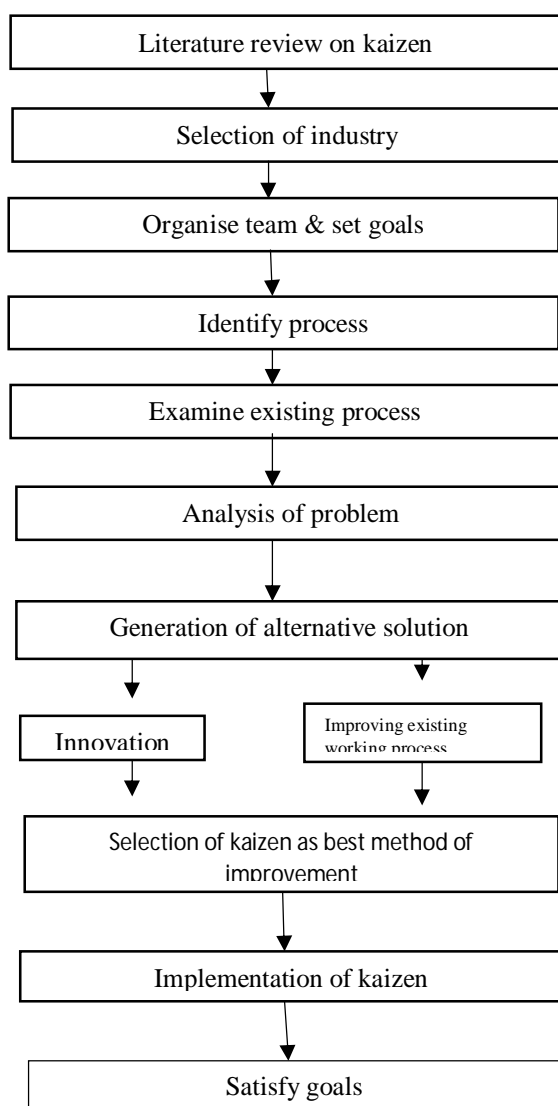
| Sr. no | Author | Name of Company | Result |
|--------|--|---|---------------------------------|
| 1 | Abhijitchakraborty, Madhuribhattacharya | Front axle manufacturing company | Production Per hour increases |
| 2 | Gundeep singh, Dr. R.M Belokar | Tractor manufacturing company | Production cycle time increased |
| 3 | Pramodkumar, vineetpandey | Wire harness manufacturing company | Productivity improved |
| 4 | Nor azlinBinti Ali | Machine spare parts manufacturing company | Losses Reduced |

D. Conclusion of literature review

From the above literature reviews we have concluded that after applying kaizen in a SME productivity increases and it also helps in saving time. Kaizen can help industries to reach their breakeven point easily. The industry in which we were working also facing the same problem where coolant is getting wasted and the handling of scrap is improper. We produced a specific methodology to apply kaizen in the industry.

III. METHODOLOGY

The Kaizen methodology is used for improvising the organizational work in industries. The idea behind using kaizen for implementation after reviewing every aspects we concluded that in India SMEs need improvement without investing too much money. The company which we have selected wants more productivity in less investment. Therefore we have selected kaizen as best method for implementation.



IV. IMPLEMENTATION PROCESS

A. Company Background

The XYZ Company is located at MIDC Hingna, Nagpur, Maharashtra in India. The main Product of this company is ash handling plant. They produce other products also. The company is project based company it focuses on the customer's requirement & specifications of product and produces it accordingly. The company has 400-500 employees working for them and a turnover of 100cr. Since we have identified the problem so we want others employees to contribute with us.

B. Problem Statement

1) *Problem:* As XYZ Company is producing various products they require machines. This company is using variety of machines for production. Some of them are lathe machines, here we found a lathe machine which was wasting coolant, while working the coolant is getting waste and falling on the ground because there is no tank and leakage in the tray of the machine. Because of this wastage the company was facing loss. The loss is not much to affect the turn over. And this problem is also creating problems for the worker in the working environment and productivity. The project research is basically focused on the reduction of coolant wastage and so we used kaizen as a problem solving tool. Reducing the coolant waste will help to be in more profit and workers will get a better working environment.

C. Calculations of coolant wastage before implementation

| Sr. no | Title | Calculation |
|--------|--|---|
| 1. | Coolant wastage per shift | 250ml |
| 2. | Coolant wastage per month | $250 \times 26 = 6500/\text{month}$ |
| 3. | Annual calculation for coolant wastage | $6500 \times 12 = 78 \text{ lit.}$ |
| 4. | The cost of coolant per liter | Rs. 250 |
| 5. | Total loss of coolant/yr. | $78 \times 250 = \text{Rs.} 19500/\text{yr.}$ |



Fig. 1. Coolant wastage on lathe machine.

D. Solution

To overcome this problem we have fabricated a tank to collect the falling coolant and re worked

On the tray to ensure that the coolant should not leak. We made some calculation shown above to know exact amount of Profit Company will get after this implementation.



Fig. (a) Coolant collecting tank.

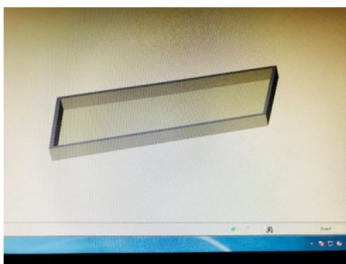


Fig (b). Coolant collecting tray.

E. Calculations of Coolant Wastage After Implementation

| Sr. no | Title | Calculation |
|--------|---|---|
| 1. | Coolant wastage per shift | 80ml |
| 2. | Coolant wastage per month | $80 \times 26 = 2080\text{ml}$. |
| 3. | Annual calculations for coolant wastage | $2080 \times 12 = 24960\text{ml}$. $= 24.96 \text{ lit.}$ |
| 4. | The cost of coolant per liter | Rs.250 |
| 5. | Total loss of coolant/yr. | $250 \times 24.96 = \text{Rs.}6240/\text{yr.}$ |
| 6. | Net profit after implementation | Rs.13,260/yr. |

V. CONCLUSION

From the above calculations it is clear that after the implementation of kaizen as a problem solving approach the wastage of coolant is reduced and the company is having a profit of Rs.13260 per year. Overall the productivity has maintenance has been improved after kaizen implementation. The key factor for this implementation is workers involvement and team support and management support.

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Prof. Aamir sayed received BE degree from Anjuman College of Engineering Nagpur and M-tech from Yeshvanyrao Chavan College of engineering in production. Author's has depth of knowledge in production.



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