

Study and Implementation Of – First ‘S’ Of ‘5s’ In College Workshop: A Case Study

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Abstract- Today's industries mainly focus on procedure high quality product with minimum cost to compute the competitive market. Therefore product as well as service industries started implementation of lean tools and techniques. Japanese lean tools are very famous and effective to improve efficiency of processes and elimination of losses. 5S is basic foundation of lean manufacturing system. It is tool for cleaning, sorting, organizing, and providing the necessary groundwork for workspace improvement. This work is intended to study and implementation of '5S' tool by removing non-value added activities, wastages and abnormality in workshop at Sant Gajanan Maharaj Collage of Engineering, Mahagaon. It will show significant improvements in safety, productivity, efficiency and housekeeping. In this paper successful implementation of first 'S' i.e. Seise is carries out and implementation of remaining Four 'S' will be done in next paper.

Keywords:Lean tools,5S, Visualization, Abnormality, Ergonomic, Elimination of Process Waste, space utilization, Case Study

1. INTRODUCTION

Lean thinking represents a set of principles and techniques for the identification and elimination of waste in manufacturing and administrative processes. 5S is a technique originated from Japan and it was first developed by Hiroyuki Hirano in 1980s. It includes five Japanese words Seiri(Sort), Seiton(Set in order), Seiso(Shine), Seiketsu(Standardize) and Shitsuke(Sustain). The 5S philosophy focuses on simplification of the work environment, effective workplace organization, and reduction of waste while improving safety and quality. It allows the enhancement of efficiency and productivity. The 5S technique is a structured program to systematically achieve total organization cleanliness and standardization in the workplace. The benefit of 5S technique is improvement in productivity, quality, health and safety. Through 5S methodology, the management can create an

environment where quality work is comfortable, clean and safe in the organization and it can ensure the compliance to standards and will further foster continuous improvement.

There is large scope to implement lean tools to work on these problems. This project is based on application of lean manufacturing tools like 5S, Kaizen and Visualization. The workshop of S.G.M.C.O.E. College is interested to apply these tools at their place. This project also aims to reduce abnormality in workshop by applying ergonomics for various working positions of employees. As an industrial perspective, this Project intimates practical implementation of lean concepts.

Harsha Lingareddy et.al.(2013) this research involves the study and change in the work place of a manufacturing industry to implementation of 5S. This strategy helps in minimizing the time of manufacturing and also increases the area of work place. The solution found by 5S approach solely minimizes several kinds of wastes in the production process and which finally helps in the development of the organization.

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J. Michalska et.al.(2007) in this paper 5S implementation results in increasing of an efficiency, safety, quality and reduction of the industry pollution. The proceedings to research clearly show that training of workers about the 5S rules is very essential.

Ravinder Kumar Panchal et.al.(2012) this paper focus on the methodology adopted in 5S and implementation of the same in the production industry. The 5S rules bring the great changes in the company, for example: process improvement by costs' reduction, increasing of effectiveness and efficiency in the processes, maintenance and improvement of the machines' efficiency, safety increasing and reduction of the industry pollution and waste.

2. OBJECTIVE

- 1) To improve efficiency of the Plant by using various industrial engineering techniques.
- 2) To apply tools of lean manufacturing (5S, Kaizen, Visualization).
- 3) To apply ergonomics for various working positions of employees.
- 4) To reduce abnormality in organization.

3. 5S PROGRAM STEPS

- Workplace Observation
- Set a Target Area Vision
- The Power of a Shared Vision
- What You See Before 5S
- What You See After 5S
- After 5S - Easy to Find, Easy to Do

4. METHODOLOGY OF 5S

A method commonly used by a manufacturing company to achieve an effective, efficient, and organized work environment, so as to boost productivity, reduce cost, and improve quality standards. 5S include five Japanese words which are seiri, seiton, seiso, seiketsu, and shitsuke.

5S is a strategy that delivers results by a systematic approach of planning and organizing the activities. 5S is a philosophy rooted from Japan and

branched into other countries. 5S is an acronym for the following Japanese terms:

- _ SEIRI [Sort]
- _ SEIRON [Set in order]
- _ SEISO [Shine]
- _ SEIKETSU [Standardize]
- _ SHITSUKE [Sustain]

1S states that:

SEIRI (sorting and disposing the unnecessary items). Deals with sorting all the tools, materials and other equipment in the workplace. Important equipment is stored accordingly, which reduces the hazards at the work place.

'5S' is workplace management to minimize the loss of time and unnecessary movements as well. It comprises 5 principles in making the organization highly efficient and effective. In that 1st s is:-

Seiri: - (sorting)

1. Perform sorting activity at your workplace i.e. into wanted and unwanted things.
2. Remove all the unwanted things that are at your workplace.
3. Only keep those things that you need.

5. PROBLEM STATEMENT

The following problems occurred before implementation of '5S' in the Workshop:

1. Improper utilization of storage space for raw material, bins and finished products.
2. Wastage of time in searching the raw material due to non-permanent location for storage of raw material.
3. Low productivity due to the time wastage in searching for tools, materials due to improper workplace management.
4. Presence of unwanted materials at the workplace which affects the moral of the worker while working.
5. Useful storage space being acquired by the unwanted materials.
6. More time and cost required for the inventory process of unwanted stored materials in raw material stores.
7. No well defined space for storing the unwanted or rejected material.
8. Unequal participation of officers and workers in workplace management due to non-standardization.

9. Improper utilization of resources like energy, space, etc.
10. Lack of safety.

6. FIRST 'S' IMPLEMENTATION METHODOLOGY:

Following steps are to be taken for implementation of 'seiri';

1. To create awareness among the students, teaching staff, non-teaching staff who working in workshop for the implementation of '5S', various awareness programs and presentations were undertaken by the various experts in the organization. Also the team

who was going to working on implementation visited the leading organization's in which '5S' had already being implemented successfully.

2. As the whole workshop consist of various departments so it was difficult and impossible to imply directly the '5S' technique in the workshop. Hence the workshop was simplified into various zones consisting of specific departments along with it, the zone leaders and sub-zone leaders were also appointed.

The organization was simplified as shown in below table,

Table no.1: Simplification of workshop

ZONE	ZONE LEADER	DEPARTMENT	INSTRUCTOR/ SUPERVISOR/ MEMBER
Periphery	Mr. S. Gawali	1) parking & main Gate	Mr. A. kesarkar
		2) Garden & periphery road	
		3)Supervisor cabin&Tool room	
		4) raw material & scraphold area	
Production	Mr. R. D. Ghulanavar	1) Machine shop	Mr. B. Guravangol
		2) Smithy Shop	Mr. P.R. Jadhav
		3) Carpentry Shop	Mr. N. Lohar
		4) Welding Shop	Mr. P.D. Karale
		5) Sheet Metal Shop	Mr. S. S. Sutar
		6) Fitting Shop	Mr. S.Kalbutki
Labs	Mr. A.J. Deokar	1) IC Engine & AME Lab	Mr. S. Kalbutki
	Mr. A.S. Kesarkar	2) Metallurgy & FM Lab	Mr. S. Kalbutki

3. Now as the Workshop was simplified into different zones, the '1S' activity was undertaken by the respective zones under the guidance of respective zone leaders.

4. After the implementation of '1S' in various zones, the audit was conducted by the audit team of the college management. Then the queries raised from the audit by the audit team were taken into consideration by the respective zones and the corrective measures were taken on it. The structure of Audit team is as follow in below flow chart,

5. After that, the presentation session was conducted on '1S' for the whole staff along with the workers.

6. All the materials in the workshop was sorted and classified in tow types as wanted and unwanted materials.

7. After this unwanted materials are again classified with the help of Red Tag.

8. Finalize and Marking of Red tag zone and its sections like burr, metal scrap and plastic scrap etc.

Detail implementation process with its photos is explained in below. Also implementation of remaining four 'S'has started and this work will be added in next paper.

Principal



Head of the Department

↓
Workshop Superintendent

Fig-1: Audit Team Structure

7. ACTUAL IMPLIMENTATION OF FIRST 'S' IN THE SIMPLIFIED ZONES SEIRI (SORTING-1S)

<u>SGMCOE WORKSHOP</u>	
Date- Zone- Department- Name of item-	Qty-
REASON	
1. Absolute 3. Not in location 5. Unnecessary	2.Scrap 4. Defective 6.Others
ACTION	
1. Move to scrap yard 3. Segregate 5. Others	2. Locate properly 4. Rectify
RESPONSIBILITY	SIGN
Mr.	

Fig -2: Red tag card

Sorting aims for removing all the unwanted materials from the workplace. After sorting the unwanted materials from the workplace, they are placed in the red tag area and the details of it are noted down on the red tag card (as shown in Fig -2). The materials noted down on the red tag card are then moved to scrap yard or located properly or rectified or segregated or returned to the supplier based on the decision of audit team and zone leader.

Above figure show sample copy of the Red Tag which is used for sorting he material in workshop.

Some photos which are captured during the sorting stage,



Fig -3: Material before sorting

In above photos it is clear that all materials (wanted and unwanted) are grouped together. With the help of First principal of S5 i.e. seiri we are stated sorting this materials in various categories for simplification. Sorted material is grouped by wanted and unwanted materials and further unwanted materials classified in Red Tag zone by Burr section, Metal scarp and plastic scarp etc. below photos shows the details about the same.



Fig -4: Sorted Material with Ret tag attachment



Fig -5: Red Tag Zone

8. CONCLUSION

This work shows, by use of simple Japanese Lean tool measurable improvements at shop floor. This work done at SGMCOE, Mahagaon college workshop to improve working standardization, by eliminating non- value added activities, wastages, etc. First 'S' i.e. Seiri is successfully implemented in college workshop and result shows systematic sorting all elements in workshop, and unwanted materials is grouped together as in red tag zone. In this red tag zone elements is further sorted and discarded to scrape section. Therefore systematic storage of all required material is done and which improves working standardization. After successful implementation of 5s in shop floor there will be drastically changes in working environment, resource utilization than previous.

In next paper, remaining 4s implementation, improvement and comparison study of before condition & after condition of workshop will be done.

ACKNOWLEDGEMENTS

With deep sense of gratitude we would like to thanks to all the people who have lit our path with their kind guidance. We are very grateful to these intellectuals who did their best to help during the case study.

It is our proud privilege to express deep sense of gratitude to Mr. M.G. Mullasir, Assistant professor and '5S' project guide as well as workshop superintendent of workshop, SGMCOE, Mahagaon for his valuable guidance and kind permission for the completion of the case study. We are also thankful to the whole organization. And lastly we thanks to our

H.O.D and staff of Mechanical Department for their timely suggestion.

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