

Study and Implementation of 5S at Hitesh Mechanical Pvt. Ltd.

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Abstract: Hitesh Mechanical Pvt. Ltd. (MIDC Rabale), aims to improve the productivity and optimization of available resources at their disposal. The purpose of this paper is to study, analyze and propose the 5S system at Hitesh Mechanical Pvt. Ltd and try to improve the system to decrease the improper management of the facility and to decrease the material wastage. At the starting a survey is conducted to make records what are the current management scenario in the facility regarding the tools, equipment, and material handling and track of orders and schedule of the maintenance.

Index Terms - 5S, lean manufacturing, quality, waste.

I. INTRODUCTION:

As the industrial society is advancing in the technology and more better methods and process are being developed. It becomes difficult for the small-scale industry to adopt. As small-scale industry largely depends upon its ability to innovate, improve operational efficiency and increase its productivity to compete and maintain its position in the market using all the resources at their disposal. As said for the industry to be economically more viable. It is important that it is well organized take care of the materials available in the inventory and most important optimize the resources in the facility. Thus, 5S is one such method that can help the industry to achieve such quality and service.

5S is typically Japanese composition of five words, those are seiri (organization), seiton (neatness), seiso (cleaning), seiketsu (standardization), shitsuke (discipline). It is a management system platform which can be used along with total productivity maintenance [3]. The employment of 5S results in standardization and discipline at workplace. Japan is the torch bearer of the said management system of 5S. It was initiated in the manufacturing sector and extended to the other industries and service sectors.

<u>Sr.No</u>	PARAMETERS	Not incorporated (1)	Poor (2)	Good (3)	Excellent (4)
1	Raw material storage		✓		
2	Flow of material		✓		
3	Inventory order and record			✓	
4	Tools management and record			✓	
5	Machine placement			✓	
6	Scrap management		✓		
7	Nut, bolts, etc. placement and management		✓		
8	Available extra material Stock records (i.e. reusable materials)		✓		
9	Section available for different products		✓		
10	Maintenance schedule			✓	
11	Use of tags for raw material	✓			
12	Different areas for different operation		✓		

Table 1 Inspection Checklist

1. PROBLEM STATEMENT:

Hitesh mechanical Pvt. Ltd., New Mumbai is a fabrication company located at MIDC RABALE. Due to the multiple products being produced with variable nature, size and application along with different and variable manufacturing process at the same, the facility seems to be unorganized in many ways, no proper record maintenance systems are in place, and due to the variable material requirement, every time it costs the company with higher material handling and improper inventory records adds on

the material and labor costs pulling down the profitability. Increase in the wastage of inventory area makes material handling difficult.

2. PROPOSED SOLUTION:

In response to the above problem the 5S system is identified as proper solution to many problems at hand. The implementation and reorganization of each section systematically with proper data maintenance of available stocks may prove game changer.

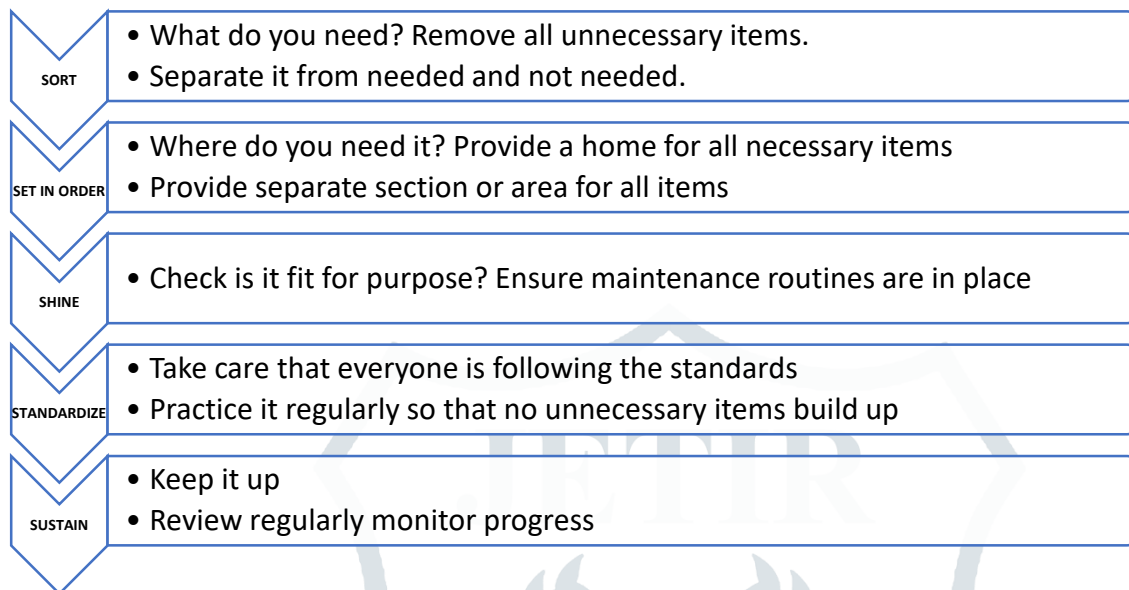


Fig 1. 5S system

II. LITERATURE REVIEW:

- [1] R. S. Agrahari [1], P. A. Dangle, K.V.Chandratre , have proposed the method and implementation 5S system in the industries. They have explained the different stages of 5S, its steps and methods that one can implement this method and organize the systems and procedures in the industry.
- [2] Dinesh B. Shinde [2], Prashant N. Shende have explained the implementation of 5S in the plant considering the plant layout of a small-scale industries, they have found that 5S technique has improved the visibility of problem condition, reduced wastage of material, improved safety, etc. also it helps the culture to develop a new sense of discipline and order that carries over in activities among the management and employees.
- [3] Prof. Saad Shaikh [3] and co-authors in their paper, have reviewed the 5S technique and explained the methods of implementation. During their study they found that this method is very useful and beneficial in industrial organization and by implanting it industries can improve the quality, production rate and the overall performance of the plant along with improvement in balance sheet
- [4] Ravi Chourasia [4], Dr. Archana Nema in this paper they have reviewed the implementation of the 5S methodology as one of the tools of lean manufacturing. They have reviewed and studied various papers and explain the 5S and they concluded that the use of 5S in an organization provides a safe environment.

III. METHADODOLOGY:

5S is a manufacturing management technique to organize work place. These are five Japanese techniques (5S) which standardizes the process to improve the work in the manufacturing facility. The implementation of 5S is divided in to five different steps and that is discuss below:

1. SEIRI / SORT:

Seiri or sorting is initialization of implementation in 5S, it includes categorical sorting of the required items depending upon their importance. The systematic removal of unnecessary items, work pieces from the shop floor improves and optimizes the workplace management.

The necessary and unnecessary items are available in the work area should be sorted and classified. The benefit of sorting is that the identification of the materials, tools, equipment and necessary items become much easier. It helps to maintain the workplace clean and well-organized inventory with improved retrieval efficiency of the workplace reducing the material handling costs.

Steps for performing Sorting –

- Firstly, we trained the workers/ supervisors to make a list of all necessary and not necessary things which are causing the mixing of the resources.
- All unnecessary parts of items on work floor were brought back to its previously destined position.
- We asked the tools and machine parts should be paced in its own places.
- Checked for once, weather all necessary things sorted in their own place.
- Classification of all tools was done in consultation with supervisor.



Fig 2 Tags

2. SEITON / SET IN ORDER / STRAIGHTEN:

After sort the second step in 5S is seiton or set in order. After sorting the remaining items are to be arranged in efficient manner through the use of ergonomics principle and making sure that every item should be at proper place and none is left out. Proper signage of the workplace and inventory is also very important. E.g. Marking the area by sign boards helps to identify the areas of storage of materials and other useful items and use of labeling to identify the materials, tools, scrap, spare parts and documents and if possible, arranged that systematically for easiest and most efficient and hierarchical access. The benefits are the it increases the effectiveness, efficiency of the production and reduces the time required for seeking the items. It improves the safety.

Steps for setting the items in order –

- Firstly, we decided the positions where the items supposed to be placed, by doing discussions with staff and supervisors.
- Then segregated all tools on the basis of regular uses like drill bits, measuring tape, Vernier caliper, measurement and machining tools etc.
- Put all the important items in an accessible position based on their importance and frequency of use. Small tools should be easily accessible.



Fig 3 Before and after implementation of seiton

3. SEISO / SHINE:

Seiso is the third step in 5S. Seiso or shine is the careful cleaning of the machinery, tools, area, tables, floor and other equipment. The damages or faults will be identified such as oil leaks, etc using this technique. In this aesthetic view is taken into consideration. The benefits of this step are that it increases the efficiency of machines, finds the error in the working area, maintains the cleanliness in the facility. We intended to apply the principal at Hitesh Mechanical Pvt. Ltd.

Steps for shine –

- We checked roughly everything and clear all major sources of unnecessary things.
- We called to clean all the machine on a regular or at least on the weekly basis.
- We proposed to clean the work floor prior to the starting of the next process.



Fig 4 Before and after implementation of seiso

4. SEIKETSU / STANDARDIZE:

Standardization is to assure that we have prevailing ways of working across the departments or facilities. Through standardization uniformity in working and product quality can be achieved. The benefits of this method that it increases the safety of industry and helps in reducing the pollution created by the industry.

Steps for standardizing –

- Made an audit sheet or checklist to ensure the cleanness
- Tried to inculcate the habit to Maintain habit to check the progress in the cleanness among the employees. Management had given strict instruction about cleanness to the whole staff.

5. SHITSUKE / SUSTAIN:

Final and the last step of 5S is Shitsuke or sustain, ensuring the continuity in implementation of previous four stages of 5S. Maintain the facility clean, carry out the audits, etc. and we tried to make sure that the 5S become the culture of the business and everyone is responsible and accountable. And made sure that the exercise of the 5S is executed or audit is done once a month. The Benefits of this is that it had increased the awareness among the staff and reduced the chances of mistake.

Steps for sustain –

- The manager or the in charge of the industry was asked to take the responsibility to held a program for 5S rule. And take care that the staff should understand and practice those rules.

SR.NO	CATEGORY	ITEM	RATING LEVEL					REMARK
			0	1	2	3	4	
1	SORT (<i>Organization</i>)	1.Distinguish between what is needed or not						
		2. Unneeded equipment, tools, etc.						
		3. Items are present in corners, etc.						
		4. Unneeded inventory, supplies, arts or material present						
		5. Safety hazards (water, machines, oils, etc.)						
2	SET IN ORDER (<i>Orderliness</i>)	1.A place for everything and everything in its place.						
		2. Correct places for items are not obvious						
		3. Items are not in their place						
		4. Workstation, equipment locations are not indicated						
3	SHINE (<i>Cleanliness</i>)	1. Cleaning and looking ways to keep it clean and organized.						
		2. Equipment is not kept clean and free of dirt, oil and grease						
		3. Cleaning materials are not easily accessible						
		4. Lines, labels, signs, are not clean and unbroken						
		5. Other cleaning problems of any kind are present						
4	STANDARDIZE (<i>Adherence</i>)	1. Maintain and monitor the first three categories						
		2. Necessity information is not visible						
		3. All standards are not known and visible						
		4. Checklists doesn't exist for cleaning and maintenance jobs						
		5. All quantities and limits are not easily recognizable						
5	SUSTAIN (<i>Self-discipline</i>)	1. Stick to the rules						
		2. Number of times that personal belongings are not neatly stored						
		3. Number of times job aids are not available or up-to-date						
		4. Number of times, last week, daily 5S inspections not performed						
6	OVERALL 5S EFFICIENCY	Considering all the 5-S						

Table 2 - 5S Technique checklist

3. CONCLUSION:

After studying and implementation of this 5S methods in this industry we have able to achieve the following benefits which are as follows:

- Material travelling time is reduced by 15%.
- Efficiency of the work is increased by 20%.
- Time is reduced by 25% for finding the necessary tools and materials due to orderly arrangement.

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