

IMPLEMENTATION OF 5S TECHNIQUE IN AN AUTOMOTIVE INDUSTRY

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Abstract-This paper explains the methods and techniques of 5S to increase the efficiency of all processes in an automotive industry. Special emphasis will be given to the implementation of 5S system and elimination of losses in the industry. The need for the implementation of '5S' in the industry came into existence due to unorganized work-stations, uncomfortable working environment and the excessive wastes in the industry. Hence to get rid-off of the above factors, there was an urgent need for the successive implementation of '5S' in the organization. The successive implementation of '5S' transformed the organization drastically, right from the working conditions to the employees working satisfaction.

1. INTRODUCTION

5S is a technique originated from Japan and it was first developed by Hiroyuki Hirano. 5S is a simple tool for organizing your workplace in a clean, efficient and safe manner to enhance your productivity, visual management and to ensure the introduction of standardized working. It include five words Seiri, Seiton, Seiso, Seiketsu and Shitsuke, which means Sort, Set in order, Shine, Standardize and Sustain respectively. The 5S technique is included within „Kaizen“ which means “change for the better” [1]. It allows the enhancement of efficiency and productivity. The benefit of 5S technique is improvement in productivity, quality, health and safety [2].

5S as a methodology has come out of the techniques within Total Productive Maintenance (TPM) and from the Toyota Production System (TPS). However many of the individual components such as creating ergonomic and efficient work places can be seen to owe their roots to people such as Taylor for his work on “scientific management” and Frank Gilbreth’s “time and motion studies. [3]”



2. LITERATURE REVIEW

“A place for everything and everything in its place” is the mantra of the 5S methodology. 5S is a system to reduce waste and optimize productivity through maintaining an orderly workplace and using visual clues to achieve more consistent operational results [4]. The term 5S refers to 5 pillars of visual workplace as mentioned. These are Seiri (Sort), Seiton (Set in order), Seiso (Shine), Seiketsu (Standardize) and Shitsuke (Sus-tain) [5]. It is firstly important to understand why it is necessary to implement each pillar of the 5S methodology [6].

Seiri is necessary because:

- The factory becomes extremely crowded and hard to work in.
- Lockers, shelves and cabinets for storage get in the way of communication
- Time is wasted in tools, parts searching
- Unneeded items and equipment make it harder to improve process flow

Seiton is necessary because it helps eliminate many kinds of waste in the workplace:

- Motion Waste: Person sent to find cart searched full factory
- Searching Waste: No one can find the key to the tool cabinet

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- Waste of Human Energy: Frustrated worker gives up searching for template after two hours
- Waste of Excess Inventory: Desk drawers are full of papers and stationary supplies

Seiso avoids certain problems like:

- Puddles of oil or water lead to slippages and injury
- Cutting shaving, dirt can get mixed up in the production resulting in defects
- Cutting shaving can get into people's eyes and create injury
- Windows are so dirty so no sunlight enters – Defects are less obvious in the dark
- Filthy work environment lowers morale

Seiketsu avoids problems like:

- Conditions go back to their old undesirable levels even after companywide implementation
- At the end of the day piles of unneeded items are left from the day's production and lie scattered.
- Cutting shavings constantly fall on the floor and need to be swept frequently
- Even after implementing 1S and 2S, soon the office is cluttered with more stationary supply than needed.

Shitsuke avoids problems like

- Unneeded items begin pilling up as soon as sorting is completed.
- No matter how well Set in Order is planned and implemented, tools and jigs do not get returned to their designated places after use.

3. ORGANIZATION INTRODUCTION

XYZ organization established in 1956 is an automobile manufacturing industry wherein the product is designed as per the customer requirements, prototype are manufactured, tested and validated before mass production. The products are manufacture at various locations depending upon the availability of skilled labours and logistics benefit.

4. PROBLEM STATEMENT

The following problems occurred before implementation of "5S" in the organization:

- Improper utilization of storage space for raw material, bins and finished products.
- Wastage of time in searching the raw material due to non-permanent location for storage of raw material.
- Low productivity due to the time wastage in searching for tools, materials due to improper workplace management.
- Presence of unwanted materials at the workplace which affects the moral of the worker while working.
- Useful storage space being acquired by the unwanted materials.
- More time and cost required for the inventory process of unwanted stored materials in raw material stores.

5. IMPLEMENTATION OF 5SMETHODOLOGY

5.1 Seiri

Seiri means to remove all items from the workplace that are not needed for current production / operations. This is done with the objective of saving and recovering space. The implementation of Seiri is done in the following manner:

- The company has to be divided into several small zones such that every inch of space in the company is included when all zones are combined. Assign coordinators for each of these zones. The zone will include garden, security cabins, toilets, cafeteria, etc. also
- Identify a red tag holding area. Red tagged items are those which are considered to be unnecessary in a particular area/zone.

5.2 Seiton

Seiton means to arrange needed items so that they are easy to use and label them so that anyone can find them and put them away. The implementation of Seiton is done in the following manner:

- Locate the items in the workplace according to their frequency of use
- Place frequently used items near the place of use
- Store infrequently used items away from the place of use
- Store items together if used together, and in sequence if used in sequence.
- Make storage space larger than the item so that easy to put back

5.3 Seiso

Seiso means to keep everything swept and clean. This is done with the objective of inspecting for problems and taking faster corrective actions. The implementation of Seiso is done in the following manner:

- Determine Shine targets
- Determine Shine assignments

- Determine Shine Methods
- Prepare tools

5.4 Seiketsu

Seiketsu means to create a consistent way of doing tasks and procedures. This is done with the objective of ensuring that the condition does not deteriorate back to the condition it was before implementing 1S, 2S and 3 S. The implementation of Seiso is done in the following manner:



- Decide who is responsible for 3 S activities
- Integrate 3S duties into regular work duties
- Check on how well 3S conditions are being maintained
- Prevent unneeded items from accumulating
- Prevent things from having to be put back



5.5 Shitsuke



Shitsuke means to make it a habit of properly maintaining correct procedures. It is done with the objective of achieving higher productivity and better quality through higher employee morale.

The implementation of Shitsuke is done in the following manner:

- Awareness - All need to understand what 5S is about
- Time - Time has to be allocated to do the 5S
- Structure - A Structure has to be formulated on how and when 5S activities will be done
- Support - Management support needed in acknowledge-ment, leadership and resources.
- Rewards and recognition - Efforts need to be recognized
- Satisfaction and Excitement - This needs to be shared in the entire organization

5S Sheet-1s			
LMS		Product shorting	
Before 5s		After 5s	
			
Before 5s		After 5s	
Problem	idea	Result	Benefits
Difficult to find	Different products placed in different racks	Easy to find	Product easily find in the place.

5S Sheet-2s			
LMS		Tools are difficult to find	
Before 5s		After 5s	
			
Before 5s		After 5s	
Problem	idea	Result	Benefits
Tools difficult to find	Specify each tool position	All Tools clearly visible &	Easy to find.

		easy to find	
5S Sheet-3s			
LMS		Cleaning the machine	
Before 5s		After 5s	
			
Before 5s		After 5s	
Problem	idea	Result	Benefits
Difficult to Work on it	Cleaning & oiling the machine	Smoothly working	Easy to work & time Reducing to complete a work

6. ADVANTAGES OF 5S IMPLEMENTATION

The successful implementation and execution of the 5S principles in various organizations results several advantages as mentioned following.

- 5S concept is very simple and easily understood by everyone because this only requires knowledge of the conventional discipline and high commitment. This practice can be implemented at all levels.
- 5S will foster teamwork, discipline and will increase the sense of responsibility and compassion for company.
- 5S will create clean, productive work environments and secure the delivery system towards a world-class.
- On-going commitment from management and involvement are the cornerstone of all citizens for the successful implementation of 5S practices.
- 5S is an on-going need to maintain excellent service delivery performance.
- Assessment of Internal Audit will normally move the organization to continually repair the quality and effectiveness of services delivered to customers.

7. CONCLUSION

Continuous improvements have become especially important in the Indian scenario in the past decade. The reason behind this is the low availability of finance and the necessity to achieve global quality standards within the available re-sources. To achieve this many companies are adopting techniques of lean Manufacturing. The 5S system is a good starting point for all improvement efforts aiming to drive out waste from the manufacturing process and ultimately improving a company's bottom line production by improving products and services and lowering costs. Successful implementation of 5S methodology has found increase in productivity and hence profit levels. The secondary benefits of implementing 5S methodology included higher enthusiasm and punctuality among the workers and safer working conditions. There is also great scope for improving this methodology. Now, the 5S concept is evolving into a 7S Methodology. There has been a prolonged debate since past few years whether to add 'Safety' and 'Security' as the two new S's or not. Therefore, we can say that this methodology is still evolving and a lot of innovations to implement this methodology are also coming up.

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