

IMPLEMENTING '5-S METHODOLOGY' IN PIX TRANSMISSION LIMITED, NAGPUR.

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ABSTRACT

The objective of this paper is to implement 5-S Methodology at the Pix transmission limited. The 5S Process or simply "5S" is a structured program to systematically achieve total organization cleanliness and standardization at the workplace. A well-organized workplace results in a safer, more efficient, and more productive operation. It boosts the morale of the workers, promoting a sense of pride in their work and ownership of their responsibilities.

I. INTRODUCTION

5S technique was originally invented and belong to Japan, and made up of five Japanese words that starts with the letter 'S'. Those words are as follows:

1. SEIRI
2. SEITON
3. SEISO
4. SEIKETSU
5. SHITSUKE

The table 1 shows what these individual word means. An equivalent set of five 'S' word in English have likewise been adopted by many, to preserve the "5S" acronym in english usage. These are: Short, Set, Shine, Standardize, and Sustain.

Table 1: 5S methodology

Japanese Term	English Equivalent	Meaning
Seiri	Tidiness	Throw away all rubbish and unrelated materials in the workplace.
Seiton	Orderliness	Set everything in proper place for quick retrieval and storage.

Seiso	Cleanliness	Clean the workplace; everyone should be a janitor.
Seiketsu	Standardization	Standardize the way of maintaining cleanliness.
Shitsuke	Discipline	Practice 'Five S' daily – make it a way of life; this also means 'commitment'.

II. OBJECTIVE OF THE STUDY

- Creating and maintaining well-organized and high quality workplace.
- To ensure the proper cleanliness inside the industry workshop and implement a particular standardized routine of processes and methods by using 5-s management tool.
- Optimize the resources, work force and the workspace. This will reduce the wastage in the industry.
- Promoting “5-S” awareness amongst the workers.

III. METHODOLOGY OF 5S

SEIRI (Tidiness)

- This is the first step of the 5S process and refers to the act of throwing away all unwanted, unnecessary and unrelated materials in the workplace.
- People involved in seiri must not feel sorry about having to throw away things. The idea is to ensure that everything left in the workplace is related to work.
- Even the number of necessary items in the workplace must be kept its absolute minimum.
- Because of seiri, simplification of tasks, effective use of space and careful purchase of item follows.

SEITON (Set in Order)

- Seiton, or orderliness, is all about efficiency. This step consists of putting everything in an assigned place so that it can be accessed or retrieved quickly, as well as returned in that same place quickly.
- Its objective is to place for everything and everything in its place, with everything properly identified and labeled.
- If everyone has quick access to an item or materials, work flow becomes efficient, and the worker becomes productive.
- The correct place, position, or holder for every tool, item, or material must be chosen carefully in relation to how the work will be performed and who will use them.

SEISO (Sweeping or Shining)

- Seiso, the third step in '5S' says that 'everyone is a janitor'.
- Seiso consists of cleaning up the workplace and giving it a 'shine'.
- Cleaning must be done by everyone in the organization, from operators to managers.
- It would be a good idea to have every area of the workplace assigned to a person or group of persons for cleaning.
- At the end of each shift, the work area is cleaned up and everything is restored to its place.
- No area should be left unclean.
- Everyone should see the 'workplace' through the eyes of a visitor – always thinking if it is clean enough to make a good impression.

SEIKETSU (Standardizing)

- The fourth step of 5S consists of defining the standards by which personnel must measure and maintain cleanliness.
- Seiketsu encompasses both personal and environmental cleanliness.
- Visual management is an important ingredient of seiketsu.
- Color-coding and standardize coloration of surroundings are used for easier visual identification of anomalies in the surroundings...
- Personnel are trained to detect abnormalities using their five senses and to correct such abnormalities immediately.

SHITSUKE (Sustaining)

- The last step of "5S" shitsuke means 'Discipline'.
- It denotes commitments to maintain orderliness and to practice the first 4S as a way of life.
- The emphasis of shitsuke is elimination of bad habits and constant practice of good ones.
- Once true shitsuke is achieved, personnel voluntarily observe cleanliness and orderliness at all times, without having to be reminded by management.



Figure 1: 5S words

IV. BENEFITS OF 5S PROGRAM

- The benefits of 5S are numerous. Some can be measured directly but many benefits have no direct measure, but results in improvement in all the fields.
- Some of the benefits of implementing 5S are listed below.
- Error free operation resulting in fewer defective items thereby increasing the overall quality of product.
- Safe and comfortable operations reducing the chances of accidents.
- Machinery and equipment can be carefully maintained, reducing the number of breakdowns.
- Operations can be performed efficiently, eliminating waste thereby increasing the efficiency and productivity.
- Improved morale of the worker aids greater commitment to jobs.

V. IMPLIMENTATION

PIX Transmissions Ltd. is the leading manufacturer of Belts and related mechanical Power Transmission products in India. The Company features state-of-the-art Belt manufacturing units as well as a completely automated Rubber Mixing facility in Nagpur. PIX Transmissions Ltd. enjoys significant brand equity in the Power Transmissions industry, with strong local as well global presence. The company has overseas subsidiary operations in Europe, and Middle-East, in addition to over 250 committed Channel Partners in over 100 countries worldwide.

Phase 1 – Seiri (Sorting)

Sorting has been focusing on eliminating and removing all unnecessary items from the workplace that are not needed. Table 2 shows the list of all unwanted and unnecessary materials of workshop which is to be thrown.

Table 2: list of items

Sr. No.	Material	Quantity
1.	Motor	6
2.	Rubber diaphragm	1
3.	Waste oil can	2
4.	Pallet	1
5.	Thermocol box	1
6.	Plastic bags	3
7.	Threads	1
8.	Cardboard box	2
9.	Rubber sheets	2
10.	Plastic box	2
11.	Cotton waste	3
12.	Wire mesh	1
13.	Plastic tray	1
14.	Metal pipe	1
15.	Metal pieces	1
16.	Fuse bulbs	3
17.	Metal plate	2
18.	Waste rubber belts	5
19.	Chain sprocket	2
20.	UPVC pipe	1
21.	Square metal rod	2

22.	Valves	4
23.	Broken gauges	1
24.	Metal roller	4
25.	Pneumatic systems	3
26.	Motor cover	1
27.	Flange	3
28.	Pot diaphragm	2
29.	Broken cranes	2
30.	Wooden pieces	3
Total		66

Benefits of Seiri:

- Improve the processing in the work place.
- Reduction in the cost.
- Solves the problem of Stock of item.
- Problem of losing tools eliminated.
- Better Work area.

Phase 2 - SEITON (Set in Order)

The 5S implementation process is continued with second phase, set in order where essential material and items are organized neatly in order to minimize wasted employee motion, walking and material movement. Racks and items arrangement have been done. The most frequent used items have stored on the lowest compartment and followed by less frequent used items until the top compartment.

Under this phase, all the useful tools and materials are arranged in its proper place so that the worker can find the required items easily.

All the materials, racks, machines and tools are labeled with names, signs and color codes so that it can be easily identified to the workers.

Benefits of Seiton:

- Increases the efficiency of the production.
- Effectiveness increases.
- Time required for seeking the items is reduced.
- Improves the safety.

Phase 3 - SEISO (Shining)

The shine process is implemented where the systematic cleaning has been done in the store room with the co-operation of the workers and contractors.

During the shine process, workers get rid all the dirt using the top down cleaning method which is cleaning from the ceiling to the floor.

Cleaning must be done by everyone in the organization, at the end of each shift the work area should be cleaned up and everything is restored to its place.

Benefits of Seiso:

- Cleans the workplace.
- Increases the efficiency of machines.
- Maintains the cleanness in the industry.
- Finds the errors in the workplace.
- Eliminates accidents due to cleanness.

Phase 4 – SEIKETSU (Standardizing)

This is the forth pillar of the 5S process, consists of defining the standards by which personnel must measure and maintain cleanliness. Seiketsu encompasses both personal and environmental cleanliness. Visual management is an important ingredient of seiketsu.

It is the process we ensure that what we have done within the first three stages of 5S becomes standardized.

Give Strict Instructions about cleanness to the whole workers and maintain habit to check the progress in the cleanness.

Benefits of Seiketsu:

- Increases the safety of industry.
- Maintains the good habit among the staffs about cleanness.

Phase 5 – SHITSUKE (Sustaining)

This is the final step 5S implementation methodology. The last step of “5S” shitsuke means ‘Discipline’. It denotes commitments to maintain orderliness and to practice the first 4S as a way of life.

In order to prevent the 5S condition from deteriorating, 5S audit is conducted weekly to evaluate the 5S implementation, measure the improvement and improve 5S condition. To achieve the 5thS one has to maintain all the 4S's.

Benefits of Shitsuke:

- Increases the awareness among the staffs.
- Reduces mistake resulting by staffs.
- Improves relations between the staffs.

VI. RESULT

Productivity increased due to following key points.

1. Reduction in waste

Less waste equals improved efficiency.

2. Reduced space used for storage

Less space used for storage equals reduced costs.

3. Improved maintenance

Clean equals improved maintenance & less down time.

4. Save time

Time required for seeking the items is reduced.

5. Improved safety

A clean workplace results in significant reduction in the number of injuries sustained by workers.

6. Better, more committed employees

Achieving worker commitment is one of the major goals of implementing 5S.

7. Improved quality

Quality is improved because of fewer defects in jobs and items.

RESULTS OF IMPLEMENTATION OF KAIZEN AT SHOP FLOOR:

Before: The gears of lathe machine were all over the workshop floor.



Figure 2: Gears of lathe machine

After: The gears of lathe are now kept in their proper place in the rack after implementing 5S.



Figure 3: Gears of lathe machines kept in stand

Before: Tools and equipments were kept all over the table.



Figure 4: Tools not arranged properly

After: Tools and equipments are now kept in systematic way after implementing 5S.



Figure 5: Systematic arrangement of tools

Before: Ring molds were all over in the workshop floor and work table.



Figure 6: Ring Molds



Figure 7: Stack of ring molds

After: The Ring molds are now placed in their proper place in the rack after implementing 5S.



Figure 8: Ring molds placed in racks

Before: The work area was not cleaned after the end of shift.



Figure 9: Work area before implementation of 5S

After: The work area is cleaned after the end of shift by the workers when they understand the 5S process.



Figure 10: Work area after implementation of 5S

VII. CONCLUSION

Implementation of 5S in the workshop has successfully achieved. In overall, the improvement in terms of working efficiency and workers morality at the workshop store room has successfully developed.

By studying the 5S methodology it is been concluded that this technique is very useful and beneficial in industrial organization. It has also been concluded that by implementing 5S one could improve the quality, productivity and efficiency of industrial organization; it also has positive effect on overall performance.

VIII. SUMMARY

The objectives of the study of implementing 5S in the workshop have successfully achieved. The concept and theories of 5S have understood. 5s technique which consists of 5 pillars: sorting, set in order, shines, standardizes and sustain is greatly implemented to overcome the problems at the workshop store room. From the implementation, the improvement in term of time, cost and safety importance after implementing 5s technique are successfully measured.

Finally, morality of workers has improved due to their involvement in improving their own workspace to their own benefit making their work easier and less stressful.

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