

IMPLEMENTATION OF 5S IN WORKSHOP AT DMIETR- A CASE STUDY

Prof. R. D. Vaidya¹, Radhika Trivedi², Triveni Rathi³, Swati Niwal⁴, Shraddha Panbude⁵

¹ Asst. Prof., Mechanical Engineering, DMIETR Wardha, Maharashtra, India

^{2,3,4,5} Student 8th Sem, Mechanical Engineering, DMIETR Wardha, Maharashtra, India

ABSTRACT

The research work carried out to apply the 5S methodology of lean manufacturing to solve the problems of WORKSHOP at DMIETR with the aim of proper space utilization and elimination of waste in the workshop. The objectives of the project are organizing the workplace, shortening of the time of seeking necessary things such as tools, equipment and stationary, safety improvement, clean workplace. Also eliminate duplication of unwanted and unneeded material. Before and after implementation picture are taken for the applying 5S methodology in a workplace. Workshop consists of Store room, Machine shop, Carpentry shop, Thermal lab, Project lab, Smithy shop and Foundry shop. 5S implementation has been carried out in Store room & Foundry shop. During 5s study many opportunities of improvement were found such as waste & unwanted scrap, improper operating conditions & arrangement of machines, tools, equipment etc. After implementing of 5S in the store room and foundry shop the workspace became efficient and effective, shortening of the time of seeking necessary things, proper space utilization, safety improvement, clean workplace, and improvement of the work environment.

Keywords: - 5S, Space Utilization, Elimination of Process Wast

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 include five Japanese words Seir i(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.

2. LITERATURE SURVEY

This survey is focused on 5S rating system, which make us able to understand the improvement criteria for particular S of 5S system. Here we give total rating of 25 score, which is divided in five equal parts for each S of 5S system. We give highest 5 marks to each S. After that we will make a graph which will make us able to understand the efficiency and make able to do better improvement.

2.1 Survey of Workplace

The implementation of 5S is carried out in Datta Meghe Institute of Engineering Technology And Research at workshop located at Wardha, Sawangi. Workshop consists of Store room, Machine shop, Carpentry shop, Thermal lab, Project lab, Smithy shop and Foundry shop& build-up area is 1178.32 m².

2.1.1 Store Room

The store room area is 3.77x7.96 m². During 5S survey unnecessary items such as metal and wooden jobs, unneeded inventory such as drawers, damaged chairs and tables, empty oil cans were found. The fig no. shows the store room before implementation.



Fig -1: Store Room

2.1.2 Foundry Shop

The foundry shop area is 10x7.80 m². During 5S survey improper layout, space utilization, arrangement of machines, rack & almirah were found. The fig no. 2 shows the store room before implementation.



Fig -2: Foundry Shop

3. PROBLEM STATEMENT

5S implementation has been carried out in Store room & Foundry shop. During 5S study many problems were found as follows:

- 1 Unwanted Material- During 5S study lots of unwanted scrap were found in store room, which creates trouble to sort out the needy items.
- 2 Improper space utilization- During 5S study arrangement of machines, tools, equipments, almirah, staff table in store room & foundry shop are not standard, which occupy unnecessary space and create obstruction in work.
- 3 More time to search documents, equipment & stationary- During 5S study tools, stationeries & documents are randomly arranged in almirah of store room, which results into more time to search documents, equipment & stationeries.
- 4 Work environment- Improper working condition due to unwanted Material, improper space utilization.

4. WORK DONE

Poor workplace conditions may lead to rising of wastes such as time spent in searching for needed items or motion to avoid obstacles. It may also lead to raising an accident. Implementation can be started by establishing good workplace and housekeeping conditions. 5S is lean manufacturing tool for work place organization and it is fundamental to the implementation of lean strategies. 5S is a reference to five Japanese works which described standardized clean up.



Fig -3: The 5S system

4.1 Before Implementation

Table -1: Overall 5S rating before implementation

Sr. No.	Name of the shop	$(S1+S2+S3+S4+S5)*100 / 25$	Efficiency
01	Fitting Shop	$(4.733+3+5+4.24+4.25)*100 / 25$	84.89%
02	Foundry Shop	$(4+0+5+3+3)*100 / 25$	60%
03	Smithy Shop	$(5+4+5+4.66+4.66)*100/ 25$	93.28%
04	Welding Shop	$(3.764+0+2+1.92+1.92)*100 / 25$	38.41%
05	Carpentry Shop	$(3.8+3+3+3.26+3.26)*100 / 25$	65.28%
06	Machine Shop	$(5+4+5+4.66+4.67)*100/ 25$	93.28%
07	Store Room	$(1+0+0+0.333+0.34)*100 / 25$	6.69%
Overall efficiency			63.11%

4.2 After Implementation

Table -1: Overall 5S rating after implementation

Sr. No.	Name of the shop	$(S1+S2+S3+S4+S5)*100 / 25$	Efficiency
01	Fitting Shop	$(4.733+3+5+4.24+4.25)*100 / 25$	84.89%
02	Foundry Shop	$(4+4+5+4.33+4.33)*100 / 25$	86.64%
03	Smithy Shop	$(5+4+5+4.66+4.66)*100/ 25$	93.28%
04	Welding Shop	$(3.764+0+2+1.92+1.92)*100 / 25$	38.41%
05	Carpentry Shop	$(3.8+3+3+3.26+3.26)*100 / 25$	65.28%
06	Machine Shop	$(5+4+5+4.66+4.67)*100/ 25$	93.32%

07	Store Room	$(4+5+5+4.67+4.67)*100 / 25$	93.36%
Overall efficiency			79.31%



Fig -3: 5S implementation

5. CONCLUSION

5S implementation has been carried out in Store room & Foundry shop. During 5S study many problems were found such as unwanted Material, improper space utilization, more time to search documents, equipment & stationary which result into improper working condition. The 5S implementation leads to the improvement as:

- Identify & minimize the waste.
- Better usage of working area.
- Reduce time to search documents, equipment & stationary.
- Eliminate duplication of unwanted/unneeded material.

Before implementation of 5S the efficiency of foundry shop & store room was 60 % & 6.69%, whereas overall efficiency was 63.11%. After implementation of 5S the efficiency of foundry shop & store room improves to 86.64 % & 93.36%, whereas overall efficiency is 79.31%.

6. REFERENCES

- [1]. "Effectiveness of 5s implementation on organizations performance" by Priyanka Rai Research Scholar, SNDT University, Mumbai, India, Online ISSN-2320-0073 Volume 5, Issue 1 (January, 2016).
- [2]. "Implementation of 5S Practices in the Manufacturing Companies: A Case Study" by MohdNizam Ab Rahman American journal of applied science 7(8): 1182-1189, 2010 ISSN 1546-9239.
- [3]. "A Case Study: 5s Implementation in Ceramics Manufacturing Company" by Vipulkumar C. Patel and Hemant Thakkar Bonfring International Journal of Industrial Engineering and Management Science, Vol. 4, No. 3, August 2014.
- [4]. "5s implementation in Wan Cheng industry manufacturing factory in Taiwan" by Hung Lin, Chi the graduate school university of Wisconsin-Stout May 2011.
- [5]. "5S methodology implementation in the laboratories of an Industrial Engineering University School" by Mariano Jimenez Calzado, Luis Romero, M.M. Espinosa M. Jiménez et al. / Safety Science 78 (2015) 163–172.
- [6]. "5S Implementation Studies in Biomass Processing Unit" by K. Ramesh, V.R. Muruganatham, N.R. Arun Kumar, International Journal of Innovative Research in Science, Engineering and Technology An ISO 3297: 2007 Certified Organization, Volume 3, Special Issue 4, April 2014.
- [7]. "Implementation of 5S methodology in the small scale industry" by R.S.Agrahari, International Journal of Scientific and Technology Research (IJSTR), ISSN:2277-8616 Volume4, Issue 4, April 2015.
- [8]. "Performance improvement through 5S in small scale industry" by P.M.Rojasra, International Journal of Modern Engineering Research (IJMER), ISSN:2249-6645 Volume3, Issue 3, June 2013.
- [9]. "Implementation of '5S' technique in a manufacturing organization" by S.P.Deshpande, International Journal of Research in Engineering and Technology (IJRET), ISSN: 2319-1163 Volume 4, Issue 1, Jan 2015.
- [10]. "The Impact of 5S Implementation on Industrial organization" by Arsh Ghodrati, International Journal of Business and Management Invention (IJBMI), ISSN:2319-8028 volume 2, Issue 3, March 2013.

BIOGRAPHIES



Prof. R. D. Vaidya, M-tech (Production Engineering), B.E. (Mechanical Engineering).
Asst. Prof., Mechanical Engineering, DMIETR Wardha, Maharashtra, India.