Paper on Time and Method Study

Productivity Improvement in Machining Industry by using Time Study and Method Study Techniques

[1]Parshetty Siddheshwar[1], Patil Abhijit[2], Gund Abhay[3], Takmoge Pandurang[4], Fulari Umesh[5], Bhusanna Omkar[6], Waghmare Krushna[7], Reghiwale Ramjan[8]

[9]Guide: Prof. V.P. Kulkarni

[1-9]MIT Academy of Engineering, Alandi (D) Pune

Abstract: Productivity is the tool which enhances the quality of a product. Productivity improvement is the very important factor to survive and to achieve breakthroughs in the work carried out deals with enhancing productivity in a Machining industry for continuous improvement. In production department, assembly line, machining shop, material handling, quality department there is some unwanted work process is done which is taking more time, more effort as well as increasing the product expense and worker affected some unwanted fatigue, so the productivity of the industry reduces and production cycle time also increases.

The tools and techniques like quality control, quality assurance, statistical quality control, total quality management etc. are the most favorable factor for not only to improve the quality of a product but also the improvement of the productivity as well overall efficiency of the product. In this paper we introduced the quality checking technique like Spirit level, Autocollimator, Digital measuring instruments like Vernier, micrometer, gear tooth Vernier etc.

Keywords- Productivity, firm, breakthrough, fatigue, method Study

1. INTRODUCTION

The work presented here is done in a Machining industry which is manufacturing component like engine cover, motor stool, wind turbine parts. In order to implement method study and time study techniques to improve the work process to meet the customer demand.

To improve productivity by using work study and method study in small scale industry. The purpose of this research is to improve production capabilities for small scale industries. This research is focused on company which machines motors stool for pumps. The research uses work study technique to improve work process in company, and the research objectives towards accomplished this study is to identify problems in the production work process and improve work process terms of production cycle time, number of process and production rate by proposing an efficient work process to company. This research uses systematic observation, flow process and stopwatch time study as research methodology. We concluded that the improvement of work process was executed by eliminating and combining of work process point by using different applications to reduce the inspection time.

Scope of the study

- Focused on improving productivity by reducing worker's time consumed in the process in unwanted operations.
- Ensure minimum material handling
- To reduce the employee fatigue

2. LITERATURE REVIEW

1) M P Singh (Proffesor of Jagannath University, Rajastan, India): This author relates the method study with the productivity improvement in battery production industry and published the paper in International Journal of Mechanical Engineering and Technology(IJMET)

2) Rishab Mishra (Ujjaini Collage of Engineering Ujjaini): The objective of present study is to improve the productivity in an

automobile industry by material handling system with the help of method study.and published paper in International Journal of Scientific Engineering and Applied Science(IJSEAS)

Method study:

Method study enables industrial engineer to subject each operation to systematic analysis. The main purpose of method a study is to eliminate the unnecessary operations and to achieve the best method of performing the operation

Method study is systematic recording and critical examination of existing and proposed way of doing work as a means of developing and applying easier and more effective method and reducing cost.

Method Study Procedure-

This procedure involves seven basic steps as follows:

SELECT: the work to be studied/job to be analyzed

RECORD: all the relevant facts about the present method

EXAMINE: The facts critically and in ordered sequences, using the techniques best suited to the purpose.

DEVELOP: The most practical, economic and effective method which meets the required processes to be done sequentially

DEFINE: the new method so that it can always be identified

INSTALL: The method as standard practice

MAINTAIN: The method by regular routine checks and by standardization.

In a production department of an industry there are unnecessary processes has conducted often the same work can be done using some simple and less complicated tools.

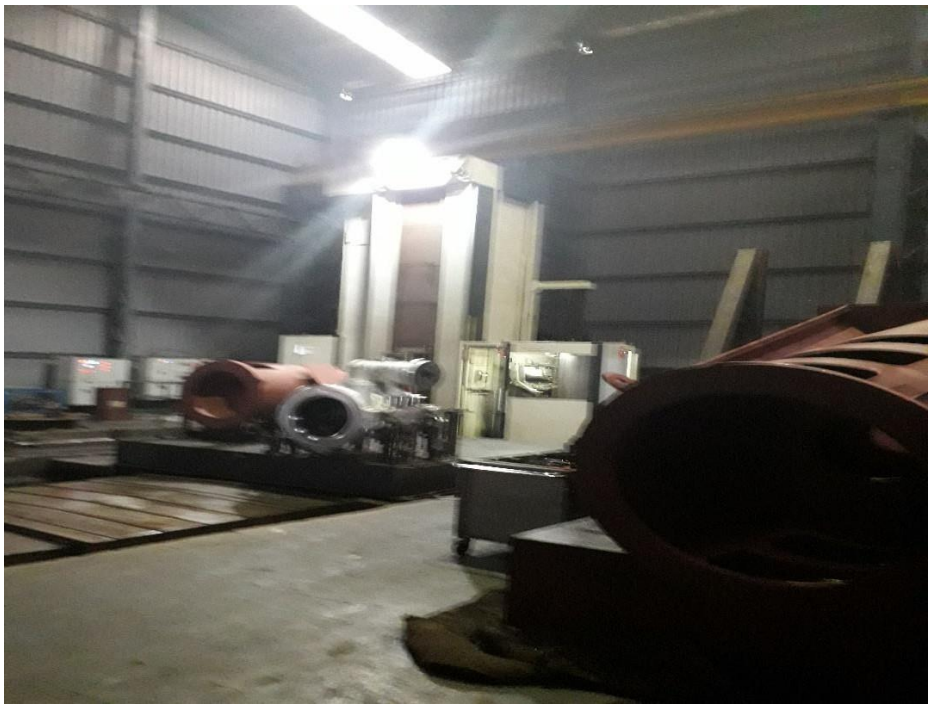
HMC-

HMC stands for horizontal machining center. Horizontal Machining, also known as milling, HMC is computerized control machine which spindle axis should be in horizontal direction enables operations like taper, facing, drilling, chamfering, grooving, reaming, boring with high accuracy and surface finish. The cutter of machine can be changed very easily.

The Horizontal Milling Machine is a very robust and sturdy machine. This HMC machine having 7tonn of capacity with 6 axis movement (3linear movement and 3angular movements).

Range of the axis movement are as follow:

X- axis 10m, Y-axis 7m, Z-axis (spindle axis)-12m.



3. WORK OBSERVATION AND MODIFICATION

Machining of motor stool spindle

METHOD STUDY AND TIME STUDY OBSERVATIONS

- **Standard time for Machining**

PROCESSES	TIME REQUIRED in MIN
Loading of work piece by crane	15
Fix by belt	90
Alignment within 1 mm by manual	90
Material and dimension checking	25
Rough facing 25 mm depth and 2 mm/m feed	360
Inspection(Flatness by Dial Gauge)	60
Operation by facing head	
ID and OD Face finishing	200
Unloading facing head	20
Drilling	100
Tapping	100
Overall inspection by quality head	120
Job Removal	30
Sharp corners are remove	20
Total	1210

➢ **Modified time for Machining after Observation**

PROCESSES	TIME REQUIRED in MIN
Loading of work piece by crane	15
Fix by belt and hydraulic jack	30
Alignment within 1 mm by spirit level	40
Material and dimension checking	25
Rough facing 25 mm depth and 2 mm/m feed	360
Inspection(Flatness by sine bar)	20
Operation by facing head	
ID and OD Face finishing	200
Unloading facing head	20
CNC Drilling	40
CNC Tapping	50
Overall inspection by quality head	120
Job Removal	30
Sharp corners are remove	20
Total	970

Productivity: It is the ratio of input parameter to the output parameter Reduction in production cycle time=

Overall time after Modification-Overall time before modification

= 1200-970

= 230 minutes

Increase in Productivity = 230/1200

= 0.1916

% Increase in Productivity = 19.16%

Major Suggestions

1. HMC Should be fitted an Automatic Tool Changer(ATC) Arrangement.
2. Maintaining of 5S Techniques during inspection.
3. Use of Digital Measuring Scale and use of spirit Level.

4. CONCLUSION

1) From the above result it can be concluded that the process can be improved based on method study, work procedure and proper utilization of machine and material. It will improve the current process by reducing the transportations, and reducing the workers fatigue.

2) % Of increase in productivity is 19.16%and reduction in time is 230 minutes

5. REFERENCES

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