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REDUCTION IN LEAD TIME AT TOOL INDUSTRY

Amit Galphade[1], Chintan Charola[2], Parth Gupta[3], Vikas Thakur[4]

[1]*Assistant Professor, Department of Mechanical Engineering, SRICT*
[2] *Department of Mechanical Engineering, SRICT*
[3] *Department of Mechanical Engineering, SRICT*
[4] *Department of Mechanical Engineering, SRICT*

Abstract *— Productivity is very important aspect of any industry. So when complete product is manufactured it is very important to have it at appointed time, but sometime it is not possible for an industry to maintain this punctuality so for that ideal time in the system has to be minimized to get the system working efficiently and to get maximum productivity. There are enormous numbers of products produced in tool industry but here more focus has been converged to the Taper Shank tool manufacturing. Bottlenecks in the process of its production is found by using OPC and FPC and by noting and comparing the practical and theoretically described time consumed in performing activities of the production in order to achieve the desired goal of the industry that is to maximize the production and minimize the cost hence making product quality products and cost efficient.*

Keywords-*Lead Time, Tool Industry, Productivity, Ideal Time, Manufacturing*

I. INTRODUCTION

Lead time is the time between the initiation and completion of a production process. In industry, lead time reduction is an important part of lean manufacturing. Lead time includes the time required to ship the parts from the supplier. The shipping time is included because the manufacturing company needs to know when the parts will be available for material requirements planning. It is also possible for lead time to include the time it takes for a company to process and have the part ready for manufacturing once it has been received.

II. COMPANY PROFILE

The Reasearch is based on the industrial defined problem faced by the company Miranda tools Pvt. Ltd. Situated in Ankleshwar GIDC. It was established in 1945 and is a part of Ashok Piramal Group, A business conglomerate with business interest in Textiles, Real Estate, Auto Components, Renewable Energy and Sports. The company manufactures HSS Tools Bits, Drills, End mills, Reamers, HSS Saws and Metal Cutting Band-saw Blades. It has its manufacturing unit & marketing office at Ankleshwar in Gujarat in western India. It is equipped with state of the art technology for producing precision cutting tools confirming to IS, BS, DIN, JIS & ISO standards.

Miranda Tools was the first Indian company manufacturing high speed steel tools to have been awarded the ISO 9002:1994 certificate by BVQI in August 1994. The company is certified ISO9001:2000 by BVQI since January 2003. The company has an extensive Sales & Marketing network comprising Depots/Branches/Resident Engineers & over 400 distributors spread all over India. Miranda Tools has a strong global thrust with almost half its sales being from exports to most developed countries. It supplies its products to its customers in USA, UK, Europe, Middle East, South East Asia, Scandinavian countries & Australasia.

III. PROBLEM DEFINITION

Heat treatment is process metalworking processes used to alter the physical and sometimes chemical properties of a material. The most common application is metallurgical. Heat treatments are also used in the manufacture of many other materials, such as glass. Heat treatment involves the use of heating or chilling, normally to extreme temperatures, to achieve a desired result such as hardening or softening of a material.
In Miranda Tools going through all operations performed on taper shank. In many stages of taper shank manufacturing, lead-time issues were considerably effecting the production. So main objective was analyzing all processes related to manufacturing of taper shank, trying to pinpointing bottleneck from the process & try to minimize ideal time from the processes. Heat treatment techniques include annealing, case hardening, tempering, normalizing and quenching.
Goal is to increase the production rate of the company, so that company can provide punctual delivery to the customer and maintain the standard, reputation and good will of the company. The production is less than what was planned and expected this is because lots of time is being wasted in non-value added activities and random movement of materials.

Main task is to focus on finding bottleneck from the total lead time so that the company can satisfy their customers by providing on time delivery and increase their profit, goodwill, standard of organization.

IV. OBJECTIVE

- To study each and every process at micro level
- Try to find the best possible way to carry out the required operation
- To find out the bottleneck and remove it
- To provide the required alternative solution to the present situation
- Replace the conventional technique of production by new ones
- Suggest efficient process which has less ideal time

V. MATERIALS/ TOOLS REQUIRED

Depending upon the implementation of solution. Different concepts & techniques are taken into consideration so as to achieve particular task. Some processes chart/tools are considerably required for finding the bottleneck in the flow of activities and processes.
Some of it is Operation Process Chart, Flow Process Chart of Taper Shank Manufacturing.

VI. SUMMARY OF THE PROBLEM

By studying whole process of taper shank we found that a lot of time was being utilize by heat treatments plant i.e. almost double the than what it was planned for, so we studied each and every process of heat treatment plant and tried to pinpoint bottleneck we noted down suggestion in order to reduce the lead time in the heat treatment department.

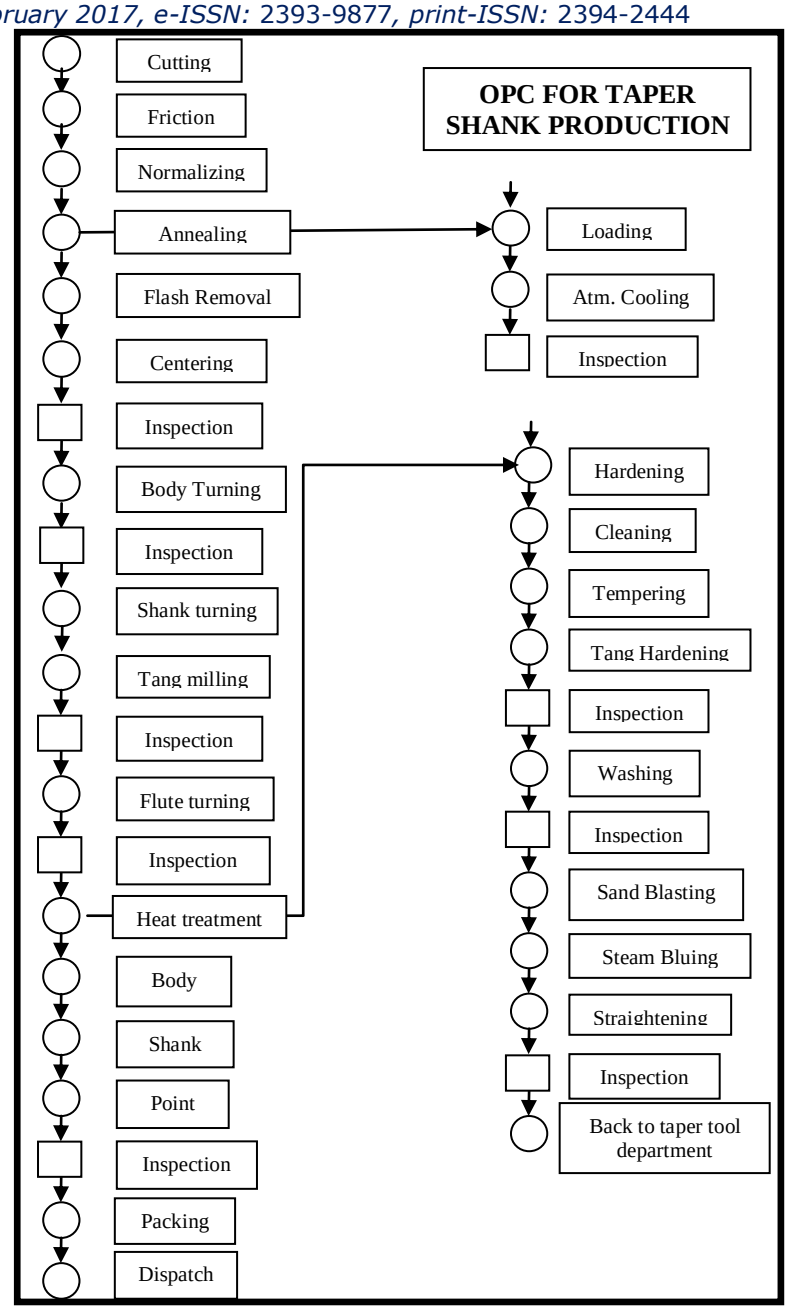

Figure 1. Operation process chart

VII. USEFULNESS WITH EXISTING

There are few solutions to increase the production by automation, AGV but this required large amount of initial investment by observing each and every activity at micro level and providing various suggestion which leads to proper flow of material without wasting much time company can make large profit.

VIII. OPERATION PROCESS CHART

The operation chart is a graphical & symbolic representation of the manufacturing operations used to produce a product. The operation chart illustrates only the value – adding activities in the manufacturing process; therefore, material handling & storage are not illustrated in this chart. Below Chart shows the complete flow of operation which are required for taper shank.

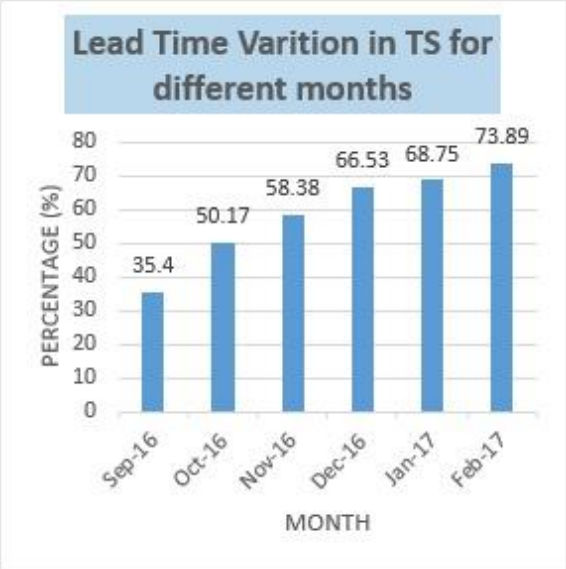

Figure 2. Lead time variation graph

Sr. No.	MONTH	PERCENTAGE (%)
1.	September-2016	35.4
2.	October-2016	50.17
3.	November-2016	58.38
4.	December-2016	66.53
5.	Janauary-2017	68.75
6.	Februrary-2017	73.89

Table 1. Lead time variation

In the month of September there was huge problem of lead time and customers were not getting the required product on time so the theoretical analysis was carried out in order to find the problem, for that different charts were being made like operation process chart, flow process chart, man machine chart etc. in order to find the bottleneck also brainstorming were carried out in order to get the solution it took near about two month and the bottleneck was obtain with many other solutions and slowly one by one different ideas were implemented and continuous improvement in the results were obtain every month. Following are the suggestions that are obtained from the analysis.

IX. SUGGESTIONS

- Baskets can be redesigned
- Upgraded furnace should be installed
- Sand blasting can be replaced by chemical method
- Utilize furnace during lunch time
- 5S can be implemented in each area of heat treatment department
- Crane repositioning & new crane can be installed
- Use of coil instead of burner into tempering furnace

X. IMPLEMENTED SUGGESTION

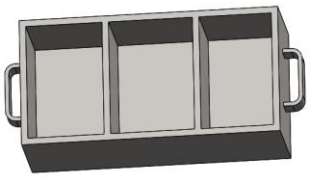

Figure 3. Basket (Before)

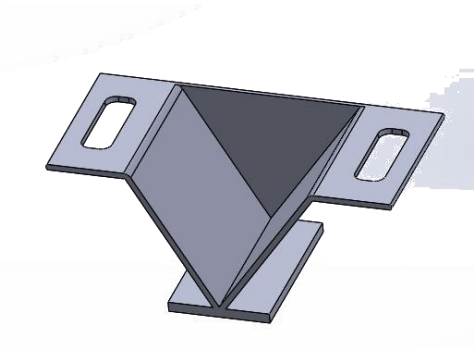

Figure 4. Basket (After)

XI. ADVANTAGES

- Production rate would increase by large amount.
- Easy work handling of tools
- Company can take large number of orders
- Profit margin of the company would increase by large amount without much investment
- Punctuality in the delivery of order would be maintain

XII. CONCLUSION

By the above study it is concluded that to reduce lead-time is most important task for any organization and there is no standard format to reduce the lead time so more attention is needed to focus on the most important obscure thing that is to find the bottleneck in the processes and to eliminate the non-value added activities in order to maximize profit without much investment and by supplementing the best outcome for various process as per requirement so as to bring industrial revolution.

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