

ARTÍCULO CIENTÍFICO

“MEJORAMIENTO DE LA PRODUCTIVIDAD EN LA LÍNEA DE PRODUCCIÓN DE CONCRETERAS DE LA EMPRESA “INDUMEI”, MEDIANTE LA IMPLEMENTACIÓN DE HERRAMIENTAS DEL ESTUDIO DEL TRABAJO”

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Abstract. *This project is developed in the Enterprise "INDUMEI" which is focused on the industrial sector, characterized by manufacture and deliver equipment to the sectors of construction, for this reason it looks for the improvement of productivity in the production line of mixers in the company "INDUMEI", through the implementation of tools of work study.*

The current situation of the company is diagnosed in the line of production of mixers identifying deficiencies in each process and raises the lay-out of the company and circuit diagram and thread.

Each activity is identified by direct observation, achieving perform valuation factor, supplement and observed time, in order to obtain the standard of time to produce a mixer.

When it makes a production cost of a mixer we identify a high raw material cost (2¼ and UPN profile) is devised for this reason a new method replacing 2 ¼ and UPN profile

to be identified; 6mm slab by which when folded in shear (bending) and UPN profile 6mm is obtained.

Finally the new method which increases productivity and reduces the cost of raw materials and standard of time getting the fulfill objective of this research. Aquí va el resumen en inglés, siendo la traducción lo más fiel a lo escrito en español.

Keywords

Study of Labor, Survey Methods, Measurement Time, Productivity, Production.

1. Introduction

The tools of the Study of Labor seek to standardize the processes in the line of production of the company of mixers INDUMEI of Ibarra city where its activities involved in the process are manual which forces to control

the activities on time and avoid delays in the delivery of the final product to the customer.

Establishing a standard of manufacturing time of mixers is very important to increase productivity, as well as restructure the process and use the best resources, to achieve favorable results of staff and equipment used in the process.

At the initial stage of the manufacturing process of mixers, 2 ¼ profile and UPN is used; expensive raw material, therefore, the process was changed, replacing profile and UPN Wholesale 6mm slab which doubled in the shear profile is obtained and UPN similar characteristics, reducing the cost of raw materials.

After the research must evaluate and analyze the results and determine the manner of how to monitor and control the new implemented method.

2. Materials and methods

2.1 Study of Labor

The Study of Labor consists of two parts: Study Methods of Work and Work Measurement times, resulting in Higher Productivity.

2.1.1 Study of Working Methods

Methods Study Procedures

Selecting the process to be improved: as cannot be improved while working all aspects of a business, the first question to be answered is what criteria the improvement work must be selected. This selection must be made from the human point of view, from an economic point of view

and from the functional point of view of labor. (Criollo, 2000).

The line of production of mixers is selected as the flagship product of INDUMEI, therefore the company needs to set the standard of time and reduce production costs.

Recording information: To improve a job, you should know exactly what it is. Except for very simple or short works rarely knows every aspect of a job, therefore, you must register by direct observation. (Criollo, 2000)

Brief Description of the processes of manufacturing a mixer.

- Preparation of the base
- Development of the arm
- Development of the pot
- Assemble the mixer
- Painted
- Final review
- Delivery of customer mixer

Analysis of operations: once registered all the details that make up the work, the next step is to analyze it to see what actions can be taken.

To analyze a job completely, the study of methods uses a serie of questions to ask about every detail in order to justify existence, place, order, person and how it is run. (Criollo, 2000)

Develop a new method: To develop a better method to perform the job, you need to consider the responses,

which can lead us to take the following actions: Delete, Change, Change, Simplify. (Criollo, 2000)

The need to reduce the cost of raw material specifically Profile 2 ¼ and UPN is identified; whereby manufacturing is proposed UPN profile and from the slab using shear 6mm.

Socialize operators in the new method before implementing an improvement is necessary to be sure that the solution is implemented according to the working conditions they will operate. Don't forget nothing and make a final review of the idea, which should include as key parts all economic and security aspects, as well as other factors such as product quality, amount of product produced.

Implementation of the new method : After taking into account all the above steps, the new working method is implemented, obtaining satisfactory results for the benefit of the company.

2.1.2 Work measurement (time study)

The time study is a work measurement technique employed to record the times and rhythms corresponding to the elements of a defined task, work performed under certain conditions, and to analyze the data to determine the time required performing the task according to a predetermined rule execution. (Kanaway 1996)

Tools for time study

The time study requires some fundamental material, namely:

- A stopwatch,
- A Board of observations,
- Video Camera,
- Study Forms Times

Development stopwatch time study

- Selection Process
- Carrier selection
- Attitude towards the operator
- Execution
- Obtain and record information
- Divide all tasks in elements
- Calculation of time observed
- Abaco Lifson
- Factor Valuation
- Supplements

Standard Time: Time required for an operator average, fully qualified and trained, and working at a normal pace, it performs a task using the method set. It's determined by adding the time allotted to each of the elements affected by the task corresponding supplement of rest and the proportion of frequential tasks. It is measured in Time Man and Time Machine.

$$Ts = To * Fv * (1 + S)$$

Equation Standard Time (Criollo, 2000)

3. Results

3.1.1 Analysis of results

Once implemented the new working method, applying the tools of work study, a detailed analysis of the results obtained with the implementation by a ratio of the initial and final position in the production of mixers of the company "INDUMEI" .

Diagnosis of the company before and after implementation

Following the diagnosis of the company "INDUMEI" before and after implementation of the tools of the study of labor in the line of production of mixers explained.

APPEARANCE	BEFORE	NOW
Standard time 1u	18,84 horas	18,15 horas
Monthly production	9,34 u	9,69 u
Total Cost Feedstock 1u	\$ 1 080.65	\$954.42
Cost Feedstock for Base and Arm 1u	\$ 199,11(Perfil y UPN)	\$72,28(Planchón, UPNP)
Labor Cost 1u	\$ 168,40	\$162,26
QPE	1,62	1,55
\$PE	\$2918,77	\$2786,86
Cost of Production 1u	\$ 1378,31	\$ 1260,47
Utility 1u	\$ 421,69	\$ 539,53

Comparative Table of Before and After Implementation

Prepared by: Luis Tobar

3.1.2 Monitoring and control of the new method

Once implemented the improved method it made an analysis of results where increased productivity by 10% was observed, as the cost of production was reduced by unit of \$ 1378.31 to 1260.47, with the same quality of product is made that obtained with the previous method, and there weren't problems in the operators with the adoption of the new method. Similarly it must be in close contact with the new working method, as it is very important to be kept in the manner specified without allowing unjustified changes through the following procedure:

1. To Plan.-Where it is planned the creation of a timeline for monitoring and evaluation in order to keep track of the method.
2. To make.- To consist in evaluating, analyzing and monitoring the new method, in order to make recommendations and suggestions for continuous improvement of processes.
3. Verify.- To consist of verifying compliance with the schedule of monitoring, through reports issued.
4. Act.- To determine strategies for implementing the recommendations, likewise determines the effectiveness of the checks in the new working method.

Conclusions

The research conducted to identify the different tasks involved in the manufacturing process and also a study of initial times resulting standard time 18.84 hours / unit.

A review of the current method is generated in the use of profile 2 ¼ and UPN for its high cost to manufacture mixers, leading to the proposal to replace and create the profile and UPN from 6mm slab.

As a result of research we implement the new working method that generates improved multi factor productivity of 10% and a monthly output of 9.69 mixers

4. Gratitude

At the Technical University of the North, the Faculty of Engineering in Applied Science and Industrial Engineering, for allowing me to reach a goal in my professional life.

To my thesis director Engineer Fausto Gualoto, who has been my guide from the beginning to the end of this research, with his knowledge and suggestions, thank you very much.

Finally to "Metal Industries Ibarra" for allowing me to perform this work of Degree in the company, thank you very much.

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