



IJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 8

Issue: III

Month of publication: March 2020

DOI:

www.ijraset.com

Call:  08813907089

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An Analysis to Industrial Ergonomics for an Effortless Working Environment

Dr. I. A. Khan¹, Pratik Bhatkar², Vinayak Jaipurkar³, Swapnil Dipke⁴

^{1, 2, 3, 4} Mechanical Department, Priyadarshini college of Engineering, Nagpur, India.

Abstract: This paper addresses the analysis to increase the comfort by developing a effortless working environment. This study starts with understanding the layout of working area and standard operation process of production inside industry and the working techniques which labour use while performing work. At the same time, observation at the working line were made to identify the problem which the labour are facing while performing any particular work. We also observed the time and space of work where the labour use to work. It was identified that there were no safety precautions or measures taken for employees. It is observed that the labour faces many problems related physical and mental health which can be rejected by a proper guidance. We also addressed the climatic condition which leads to fatigue and stresses to the labour. Appropriate guidance were made for these problems and to minimize the excess efforts carried out by the labour. Thus by the use of proper guidance, modern techniques, climatic conditions and a proper working space the efforts of the labour can be minimize.

Keywords: Ergonomic solution, productivity, safety, fatigue.

I. INTRODUCTION

This paper analyses labour human health and increasing the comfort of the work by which the labour can perform there work effortlessly in the working environment [1]. These found activities by which the labour are facing some health issues inside working environment. To improve work conditions, work tools and work structuring in order for the optimum result to be achieved from and the person at work to suffer as few setbacks as possible[2]. Ergonomics deficiencies in the work place may not result in immediate body pain but over time the body's ability to adapt fails resulting in muscle disorders [3]. Ergonomic should be seen not as finding problems but rather as giving solutions to the problems and can be applied to any industry. Ergonomic is concerned with the 'fit' between people and their technological tools and environments [4]. It takes account of the user's capabilities and limitations in seeking to ensure that task, equipment, information and the environment suit each user [5]. The scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance.



Fig.1 Industrial ergonomics [6]

II. PROBLEM IDENTIFICATION

- A. It was identified that there were no safety precautions or measures taken for employees.
- B. There is a lack of supervision which affects the productivity.
- C. In shops due to improper positioning of machines the space available for operators is low.
- D. Loading and unloading of raw material and products from trucks has to be done manually.

III. SOLUTION

- A. Ergonomics is the process of designing or arranging workplaces, products and systems so that they fit the people who use them.
- B. Ergonomics applies to the design of anything that involves people – workspaces, sports and leisure, health and safety.
- C. Ergonomics is a branch of science that aims to learn about human abilities and limitations, and then apply this learning to improve people’s interaction with products, systems and environments.
- D. Ergonomics aims to improve workspaces and environments to minimize risk of injury or harm. So as technologies change, so too does the need to ensure that the tools we access for work, rest and play are designed for our body’s requirements.

1) *Proposed Solutions Are As Follows*

- a) *Changing The Process Flow:* The process flow for different operation is not properly aligned. The plant layout must be so designed to provide a smooth flow of the product for different operation. Plant layout can be designed in such a way that the material handling time and efforts should be reduced. Moreover the movement of the worker should be minimized that will lead to better functioning of the workers in the industry.
- b) *Increase in Infrastructure:* Infrastructure plays an important role in the productivity of the workers. Proper means to handle the material in the industry can lead to the reduction in time and fatigue caused in it to the workers.
- c) *Some Solutions For This Are*
 - i) Provision of trolleys for the easy movement of the work pieces from one workstation to another.
 - ii) Inspections tools should be provided to the workers on their respective workstations so as to reduce the inspection time for each work piece.
 - iii) Proper sitting arrangement should be provided for the workers so that they could sit when the operation is going on the work piece.
 - iv) Conveyer belts can be introduced in the system so that there is an easy flow of material throughout the industry.



Fig.2(a) Use of trolleys [7]



Fig.2(b) Inspection tool kit [8]

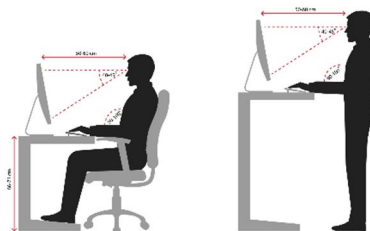


Fig.2(c) Proper sitting [9]



Fig.2(d) Use of conveyer belts [10]

- d) *Introduce Job Rotation System In The Industry:* Job rotation is the process of changing the job of every worker after a specified period of time.

The advantages of job rotation are:

- i) Workers will be skilled enough to run any machine at any point of time.
- ii) During any mishap or injury to the worker, some other worker will be able to run the machine and the machine will not be left idle and the production is not interrupted.
- iii) The job for the workers will not be monotonous. A healthy working environment will prevail in the industry that will lead to increase in the productivity.

- e) *Implementing Safety Measures In The Industry*
- i) Workers should be provided with safety gloves and boots and should be made compulsory to wear them while on machines.
- ii) To prevent the mishap due to spillage of oil on shop floor, safety mats should be put in the areas where spilling of oil is on regular basis.
- f) Change in Plant Layout: Bend saw is kept in weld shop. It is given feed in form of long rod. This rod causes obstacle in path of shop due to its length. While transporting components it becomes a hurdle in the path. Hence the band saw should be moved to the backside near the storage where large area is available.

IV. CONCLUSION

This paper has tried to rise and solve the Ergonomics problems that exist in Production processes in industries. These processes were studied and the problems were identified. Appropriate solutions were suggested by which the productivity can be raised.

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