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Research Article

Productivity Improvement by Optimizing Tow Truck Material Movement in Manufacturing Plant

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In today's competitive world, an all-round improvement in the areas such as process improvement, scrap cost reduction, quality enhancement, machine efficiency improvement, resources optimization is required to survive in the market. Among these we believe there is huge scope to improve internal logistic system with Industrial Engineering tools to reduce the cost of the product. A streamlined internal logistic system supports the production process through supply of right quantity of material at right time. This helps business to prevent loss of production, storage place, ensures safety in storage and delivery of materials using minimal resources. This present work aims to study the internal logistics involved in process industry in terms of material, people, process, equipments and provide recommendations for optimizing internal logistics processes in turn to reduce the cost of the product. Cost of material handling plays a vital role in process industry. This involves two stages. In the first stage, the current material flow has been studied using Time and motion study. In the second stage, based on the results of first stage using TIMWOOD techniques, the non-value added activities has to be removed and a new material flow system has been proposed for implementation.

Keywords: Tow truck, Optimization, logistic system, material movement.

1. Introduction

In the current manufacturing industry, getting materials delivered quicker becomes inevitable. This calls out for better optimization in handling and transporting the materials inside the warehouse or the manufacturing plant. In the Supply Chain Cycle, material handling in warehouse plays a major role. Warehouse optimization leads for quicker transportation which will significantly reduce the time to deliver a product. Material handling can be defined as the most nonvalue added activity in the manufacturing industries. There are lot of disadvantages in manual material handling which includes fatigue and stress of people when not performed accordingly.

Fig.1. Material Flow

1.1. Material movement

Material movement is related with scheduling of production control, inventory buildup, ageing, non-conformance material and hold material. Material movement adds value to product cost. It also increases effectiveness of in plant layout by reducing the cost when done with right tools.

1.2. Objective of Material movement

The main objective of Material movement is to lower unit transportation cost and provide better control of the flow of materials. It also aims to provide better working

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condition. Another main objective is to provide high productivity with low manufacturing cost.

1.3. Principles of Material Movement

- Reduction in time by using short routers
- Cassette and leaf truck to be utilized to its maximum efficiency
- Rehandling and back tracking of the materials to be eliminated
- Periodically repairing, maintenance & checkup of existing MHE

1.4. Problem Description

At present the resources used for transferring the material from source machine to the destination machine is under utilised in terms of many non value added activities.

1.5. Delimitation

The analysis of material flow and production areas is during the dayshift. The study will be conducted for the estimate of 16k tyres, which will include tow truck movement from one Business unit to other.

1.6. Outline

The project contains literature review, and then the method or approach followed to take the study, the various tools and techniques followed for the same. Then it covers the analysis and findings of the study and proposes a method to solve the problem.

2. Methodology and Formulation

2.1. Approach to detailed study

The first step is to capture the voice of the stake holders, viz., Group Leaders, Team leaders, planning & Logistics team. This becomes important since they have different problems at their end which needs to be addressed. All parties voice is taken into account before the study is conducted. The next step is to study the existing material movement and information process to understand the current scenario. This can be done using various data collection tools and approaches. This step has to be carried out by a production engineer, who is well aware of the process inside the plant.

The third step would be to identify the gap between present and expected system by analysing the current state. This is done using the various analysis tools available and also by brainstorming with the team. The next step is to recommend actions and solutions to bridge the gap. Various solutions will be discussed and recommended. The last step would be the final implementation.

2.2. Data Collection Techniques

The document analysis includes the data collected from the Logbook, which gives us the head count crew, delay due to material movement, setup change hour, battery charging time. The reason for this study is to obtain information regarding the case study.

2.3. Case Study at company

In the present state, the no of trucks and manpower are as follows:

- Each machine has its own dedicated material mover and tow truck.
- Average Speed of the tow truck is 7km/hr.
- Distance travelled in a shift of 8 hours is 42km.
- Input fed every shift is worth an output of 550 tyres.

2.4. Approach – DMAIC

In the present study, the approach of DMAIC are as follows:

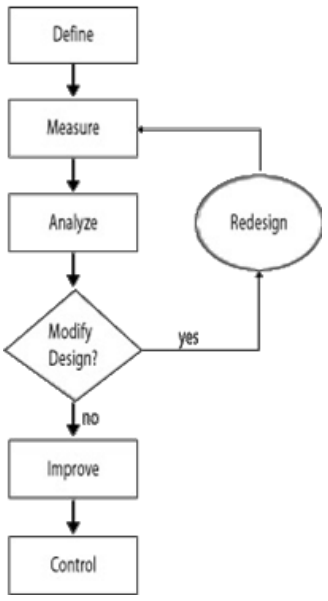

Fig.2. DMAIC Approach

3. Conclusion

The study of material movement from one Business unit to another was studied on Tow Truck and potential areas of improvement have been identified in the production process. According to the preliminary study the route optimization approach proves to minimize the non-value added tasks. To improve the productivity of Tow Truck operations, the productivity of other elements which is related to the productivity has to been developed. Based on the study, material flow and handling can be improved in several ways by right equipments and procedure which would increase the productivity of the manufacturing plant.

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