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A STUDY ON MATERIALS AND EQUIPMENT HANDLING AT SRI LAKSHME BALAJI INDUSTRIES

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Abstract:

The reason for this investigation is to help us discover the holes in Materials and Equipment dealing with at Sri Lakshme Balaji Industries and upgrade it to streamline the creation interaction. The investigation could give us data on the current materials and hardware taking care of cycles received at the association and empowers us to recommend methods of upgrading it. The examination additionally extends to investigate approaches to keep away from working environment mishaps since the representatives are overwhelmingly captivating with taking care of materials and hardware. The solace of the workers is affected by their experience, their flexibility to new hardware, convenient preparing gave, use of defensive gear and the solace of going after the controls. An organized Questionnaire is conveyed to the representatives to break down these elements. Minor changes are made in the association utilizing Kaizen strategy and the efficiency measurements, for example, Overall Equipment Effectiveness and Total compelling hardware execution are evaluated when rolling out the improvements in materials and gear taking care of. It was discovered that, carrying out Kaizen showed critical improvement in the profitability measurements.

Keywords: Lean Manufacturing, Kaizen, OEE, TEEP, Material handling, Equipment Handling.

Introduction:

Material Handling

Material Handling refers to the maneuver, safe keeping, stockpiling and administration of goods and items across all the processes like production, repositioning finished goods, dissemination to dealers and consumers, utilization by consumers and scrapping. With advanced technology like Artificial Intelligence, IoT (Internet of things) or Industry 4.0, Material handling has escalated to operate completely automatic or partially automatic that suits the requirement of logistics. With the

consensual and smooth functioning of the material handling systems, the companies can achieve a significant enhancement with customer satisfaction, reduce lead time, manage warehouses and inventory more efficiently and reduce ample amount of costs relating to management of materials. Materials handling system has to be designed in such a way that it suits the ergonomics of the employees working on it. This will ensure comfortable and productive functioning of both men and machines.

Overall Equipment Effectiveness

Generally, OEE is an upkeep KPI that actions a resource's degree of profitability. OEE is a mix of three factors that disclose to you how effective a resource is during the assembling interaction: resource accessibility, resource execution, and creation of quality. Everyone can reveal to you something else about how a resource works.

1. Accessibility – How regularly does the resource work when required?
2. Execution – How much does the resource produce?
3. Quality – what number great things does the resource produce?

At the point when a resource works with an OEE of 100%, it implies that each thing it produces is without imperfection (quality), it is delivering as quick as could be expected (execution), and it encounters no spontaneous vacation (accessibility).

Generally, gear viability is an instrument for assessing the proficiency of resources during the assembling cycle. It can likewise be utilized to explore individuals, cycles and devices that sway how resources work. At the point when joined with the knowledge from other support measurements, OEE gives an extraordinary establishment to recognizing zones of an activity that can be improved and a quantifiable method to quantify progress.

TEEP: Total Effective Equipment Performance

TEEP (Total Effective Equipment Performance) is an exhibition metric that is utilized to quantify the genuine limit of assembling tasks – showing how huge of an extension is holding back to be opened. This measurement gives makers understanding into how much potential their manufacturing plant has dependent on their present gear. TEEP thinks about Equipment Losses (OEE estimation) and Schedule Losses (Utilization estimation).

TEEP – comparatively to OEE – is utilized by makers to see how to improve their manufacturing plant's cycles and upgrade to dynamic practices in the business. What's more, to comprehend your organizations' adaptability, every one of these variables should be taken into account. The principal contrast between the two measurements is the greatest time accessible for creation. Since TEEP considers unsurpassed, the greatest time accessible for creation is day in and day out, 365 days per year.

TEEP additionally goes one stage past OEE, by accentuating the effect of planned personal time, and in doing as such, revealing the genuine undiscovered capability of a processing plant. Estimating TEEP is fundamental so you can effectively gauge and timetable schedules. By

understanding your production line's misfortunes, you can start to deal with those issues to improve dependability.

Literature Survey

John T. Mentzer (2001): This globalization of supply has constrained organizations to search for more compelling approaches to facilitate the progression of materials into and out of the organization. Key to such coordination is a direction toward closer associations with providers. Further, organizations specifically and supply chains overall contend all the more today based on schedule and quality. Getting a deformity free item to the client quicker and more dependably than the opposition is not, at this point seen as an upper hand, however just a necessity to be on the lookout.

Ardavan Asef-Vaziri (2005): A sizeable extent of assembling costs can be credited to office design and material taking care of. Office format choices include planning the course of action of components in assembling frameworks. Among the most basic material taking care of choices around there are the plan and plan of material stream designs.

Ateekh Ur Rehman (2019): In a present serious market, producing businesses are constrained to follow an orderly way to deal with comprehend and improve fabricating plant execution. An assortment of the executive's apparatuses and methods of reasoning are embraced by various enterprises to recognize regions of chance for minimization of waste and expansion of creation profitability. Lean assembling is a way of thinking of waste minimization, profitability upgrade and consistent improvement.

Ayman Bahjat Abdallah (2018): The connection among LM and advancement is bantered in the current writing, however the discussion is portrayed by an absence of experimental proof. This is one of the principals contemplates that experimentally researches the connections between IO, LM and advancement execution. It recognizes some new bits of knowledge to coordinate future examination, especially viewing diverse development types just as in help associations.

Fatine CHOUIRAF (2018): The combination of lean assembling in the association of specialty undertakings would add to this improvement. Lean is a Japanese way to deal with creation the board, in view of the end of squanders "mudas". Lean and specialty creation share a few targets, in particular creation in little arrangement, unitary creation and the draw plan of action.

Angappa Gunasekaran (2015): The essential focal point of absolute quality administration (TQM) is consumer loyalty. Persistent improvement and specialist strengthening are essential vehicles for accomplishing consumer loyalty. Viable TQM pivots likewise on administration execution in arranging, organizing,influencing and controlling exercises taking all things together utilitarian regions, (for example, marketing, purchasing, plan and designing, creation, appropriation, money and bookkeeping, HR, and so forth)

Analysis:

The existing material handling equipment has been observed physically. Further, questionnaire has also been distributed to collect responses from the employees with regards to material handling equipment. The material storage and material flow has been physically observed and the existing pattern was recorded. This helps in identifying the gaps in the practices adopted. In the existing practices, Lean process has not been adopted. This led to wastages in material, time and efficiency. To keep a track of it, the OEE (Overall Equipment Efficiency) and TEEP (Total Effective Equipment Performance) has been analyzed.

Some of the problems observed in Equipment handling is, mishandling of machines. This caused minor accidents and posed a hazard to both employee and equipment. This study aims to reduce accidents. In material storage, the materials were not stored according to priority which caused delay in the production process. Further due to inefficient material storage, the material flow was also affected which caused negative flow. The study helps to analyze the minor inefficiencies in materials and equipment handling to improve production.

Methodologies:

The strategy that was at that point existing in the organization is, Make to Order. Notwithstanding it, Lean idea of Kaizen can likewise be embraced. This guarantees ceaseless improvement of cycles existing in the organization. Kaizen alludes to the progressions made in the cycles that will upgrade it and guarantee productive utilization of assets. By carrying out Kaizen in Materials and Equipment taking care of, the overall process can be improved. The productivity metric has been estimated and examined utilizing the measurements OEE and TEEP.

The reactions recorded from workers has been investigated utilizing measurable tests in particular,

- Correlation Analysis

n= number of data points of the two variables

di= difference in ranks of the “ith” element

Spearman’s Rho= 1- {6∑ d^2/[n(n^2-1)]}

- Chi-Square Analysis

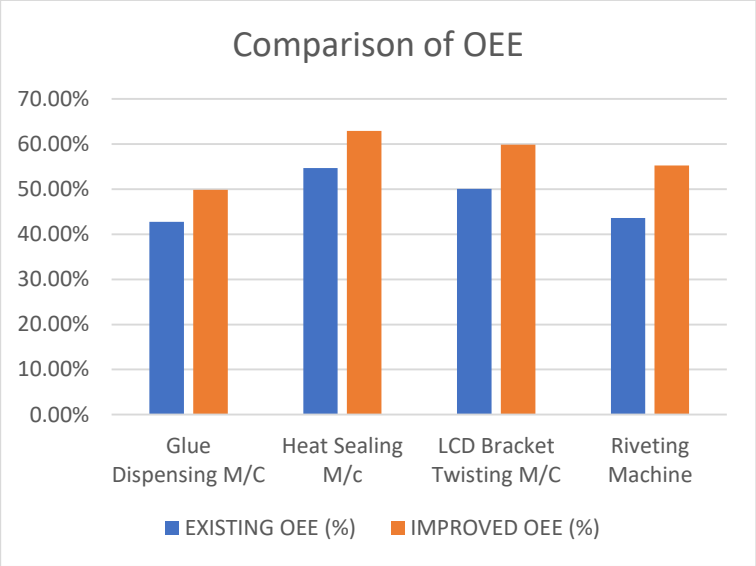
$$\chi^2 = \sum (O_i - E_i)^2/E_i$$

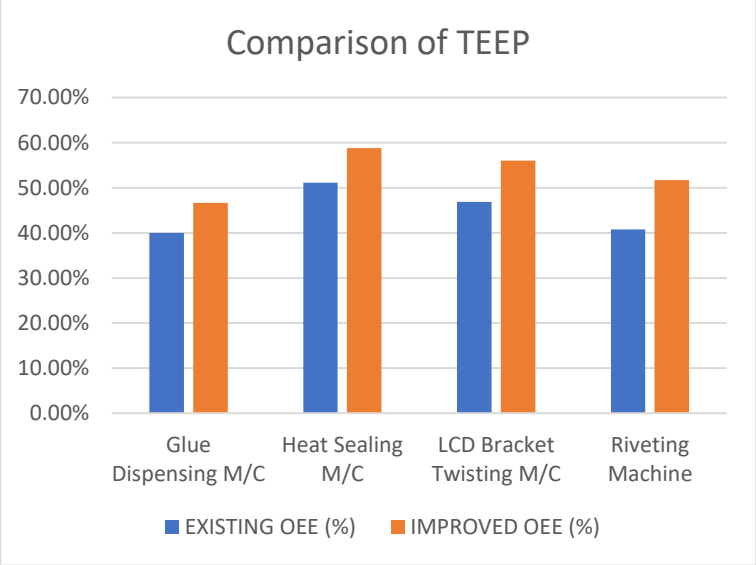
where O_i is the observed value and E_i is the expected value.

The Statistical Software utilized is, SPSS (Statistical Package for Social Sciences). From the outcomes along these lines inferred, the ends are drawn for additional improvement.

Results and Discussion:

The employees would prefer to adapt to new technology that helped in materials handling. The Correlation analysis revealed that, equipment handling is easier if the controls are within reach comfortably. After implementing Kaizen in material flow and storage, the productivity increased by a small proportion that was reflected in OEE and TEEP. In the same way, if the processes are monitored periodically and enhancements are made, the whole of production process can be improved.





Conclusion

All workplace environments are made by human for human, hence keeping it clean, efficient utilization of people and machines, efficient flow of materials, waste reduction, easy material flow and effective communication with customers will increase the production and revenue of the company. Thus, monitoring and continuous improvement of the process by applying Kaizen will increase the productivity within the organization.

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