Review Paper on "Productivity Improvement by using Poka-Yoke"

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Abstract - *Dismissal of made parts at different phases of assembling can't go on without serious consequences now days underway situation because of extreme rivalry around the world. All assembling businesses are moving toward zero deformity generation. To execute this, the first and most critical thing which is being finished by the assembling ventures is to keep the blunder or totally wipe out the mistake with the utilization of some demonstrated methods. Poka yoke is one of the techniques and this paper focuses on an application of this technique on a cutting handling tool of a liner cutting machine at a cell in liner manufacturing company. As a study of the application of poka yoke on a liner cutting machine, possibility of liner mouth misalignment to prevent the rejection and increase the productivity.*

Key Words: Productivity, Poka- yoke, Liner, Zero defects, Mistake, Improvement.

1. INTRODUCTION

These days, every single organization needs benefit, high efficiency and esteem in market. There are mottos in many industrial facilities expressing imperfection decrease targets, however a definitive point ought to dependably be zero deformities. "POKA-YOKE" is an indispensable factor in taking out deformities. Poka-yoke is an idea in absolute quality administration which is identified with limiting mistakes at source itself. It manages "trick sealing" or "oversight sealing".

1.1 Poka-yoke

A poka-yoke is any thought age or system advancement in an aggregate gainful administration process that causes administrator to maintain a strategic distance from (yokeru) botches (poka). Principle point of Poka Yoke idea is to make entire framework blunder verification that implies nobody can commit error albeit somebody needs to commit errors deliberately. It kills the imperfections or shortcomings.

This term was begat by Shigeo Shingo in 1960s for the piece of Toyota Production System. The point of Poka-yoke is to structure the procedure with the goal that missteps can be identified and remedied promptly, dispensing with deformities at the source.

1.2 Developing of poka-yoke

An orderly way to deal with develops Poka-Yoke countermeasures which comprise in a three stage investigation of the dangers to be overseen:

1. Identification of the need
2. Identification of possible mistakes
3. Management of mistakes before satisfying the need.

These means are contemplated while considering execution of Poka Yoke framework in any field since this approach stays same at all the circumstances and conditions. [1]

Example: -

Example: - Side light indicator on dashboard in bikes.
In day time if you are riding your bike so you can't see that the indicator is turn on or off. At night it's as much as simple as sugar in tea. But now a days you can see a sidelight indicator on dashboard in each bikes. If the light is turn on it automatically turn on with it. A buzzer technique is also in market but some of the bike company not allowing it to use now. Just because of high battery consumption. This decreases the accident on ways. If you don't want to take turn but your vehicle is showing that you are taking turn so it can be an accident due to this we can easily see our vehicle indicator is turn on or not properly. You can see in fig no. 01 that the indicators are properly off and in another fig no. 02 you can see the left indicator is turn on (blinking). That is the perfect example for poka yoke system. This helps us to avoid mistake which we don't want to create by own.

Fig -1: Indicator off

Fig -2: Indicator on

2. History

The Poka-Yoke method was introduced by Shigeo Shingo in 1961, when he was one of the engineers Toyota Motor Corporation. This method, in others Words are used to prevent original errors and errors in error. [2]

Shigeo Shingo, born in the city of Saga, Japan, Japanese industrial engineer who distinguished himself as one of the world's leading experts in Toyota production and production practices System. Then start in Japanese. Organizations to implement a Zero Quality Control (ZQC). One of its elements that implement the ZQC principle is the Poka-Yoke method. The name Poka-Yoke was founded by Shigeo Shingo in 1963, translates as "resistance to errors". Avoid (yoke) errors deriving from the absence of the mind (Poka). The initial term was "baka-yoke", which it means "infallible". This term "baka-yoke" was dishonorable connotation. Therefore, the term was changed to poka-yoke, which means "error-proof".

In the course of repetitive operations that depend in surveillance or memory, the Poka-yoke can save time and free the mind of the worker who forms stress. In each one Product life cycle phase, in every processes in its operations there is the possibility of errors. In As a result of errors, the final product has defects and the customer is dissatisfied and disappointed. The Poka-Yoke method is based on the practicality of it is not acceptable to produce even very small Amount of defective products. For companies, 100% product production without defects. Not just a challenge, but a necessity. Poka Yoke The method is a simple technique that allows you to reach this production. [3, 4, 5,]

3. NEED

Defects or production errors are always the key concerns of any manufacturing industry. The success of any organization depends on quality of product particularly correct product. poka-yoke It refers to techniques that make it impossible Making mistakes When an organization decides implement lean production then one of the goal is to reduce waste because nobody is interested in compensating for extra inventory in scrap account. To increase the profit percentage of the Cost pressures always turn into a headache for the top management so as to never accept continued Errors such as waste, rework, out of tolerance, etc. Instead, they are trying to reach the value of zero in this segment when customers of any company buy the product that rightly expects without flaws products and 100% conventional inspection o Statistical process control does not guarantee 100%. Products free from defects. So, we need to Reach the root cause of any problem and avoid. What gives us product without defects? [6] Poka-yoke is one of the "good" presentations kaizen, or continuous improvement Because of its preventive nature. A poka-yoke Device or solution is a mechanism or an idea that or avoid the mistake of being done either makes the error easily detectable at a glance. The ability to find errors at a glance is important because, as Shingo says, "the causes of faults lie. In the errors of the workers, and the defects are the results of neglect these errors. It follows those errors they will not become faults if the worker's mistakes are discovered and eliminated in advance. Even he adds to this that “defects arise because mistakes are made” both have a cause and effect relationship. However, errors will not become defects if the feedback is action in the error phase. Therefore, it is an effective approach to apply mechanisms to avoid making mistakes right now occur. [7]

4. Literature review: -

Everyone is working to remove the defect from his organization. A poka yoke system is invented for a gear industry. The problem which is eliminated that is the long hole while doing drilling operation on a part. We know in every plate there are always 2 sides. So they want to do drilling only one side but sometimes it’s happening both the side just because of this the parts gets fail so they fix a drilling fixture in that tool so the tool gets inside only according to that we want. First of all they did research on all the aspect of errors then what is the exact issue then resolve this by using poka yoke. [8]

An air duct manufacturing company got some points to eliminate the errors and by using poka yoke system in his company. The problem was rejection of manufactured duct after delivered to the customer. The duct is made by moulding process so some excess material remains on that the workers will remove that by sharp knifes but some time it remains same and product delivered to the customer so they use poka yoke for that. They maintain the defected piece at initial stage of defect. So that it will never go in second stage if its defected. It only goes in second process once it will perfect for the current process. They called it continues improvement. [9]

5. Reasearch methodology: -

Every organization is working for zero defects as we all know it’s not possible to eliminate the entire defect at the same time. So at this time I found some production process

errors which are responsible for low production. A company is making liner which is used in Flexible intermediate bulk container (FIBC) or can say in bulk bag. This study is being in a liner sealing department. The liner is a packet which can be hollow and can be one side shield and it's made up of LLDPE the full form of this is liner low density polyethylene. They are of heavy size. So while cutting the film by hand makes some defect in the liner means the mouth of the liner is not proper due to it many of the liner get wasted or we need to do rework on that which consume more time on this as we all know that if we are doing rework then it's again using the time on the product which should be perfect in previous time. The liner mouth perfection is totally depends on workers skill. Now they did the work with the use of scissor by holding the liner in hand. So we are eliminating the rework and product wastage percentage by using poka yoke method.

5. Expected overcome

The aim of Poka-Yoke method is to eliminate or minimize human errors in manufacturing processes and management as a result of mental and physical human imperfections. For the main part is to eliminate errors independent. The main idea of this method is preventing causes, which may result in errors and use relatively cheap control system for determining compliance of the product with the model. According to the advantages which we found on the study we can easily increase the production by 10-20 percentages by using this technique. The poka yoke is also helping us to decreasing the wastage percentages. We expect that poka yoke will help to improve the productivity of the company.

Step by step approach.

1- Indentify the error.

2- Finding the root cause.

3- Find the resolutions

4- Find the best way to resolve it.

5- Implement the invented poka yoke technique.

6- See the result and check the perfections.

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