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Productivity Analysis in the Production Process Using the Six Sigma Method (Case Study at the XSMK Company)

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Abstract

XSMK company is a company engaged in the furniture sector that produces various kinds of shelving products in Indonesia. There are problems that hinder the productivity of the company, namely waste in the production process. Six Sigma is an organized and systematic method for process improvement strategy and new product development that relies on statistical methods and scientific methods to create reductions in product defect rates. With the Six Sigma method, the company implements a vision of quality improvement towards the target of 3.4 failures per million opportunities DPMO (Defects Per Million Opportunities). For this reason, a study was conducted which aimed to determine the value of six sigma, the causes of product rejects, as well as suggestions for improvements to the company. From the results of data processing, the company has an average sigma level of 4,336 with a possible damage of 5,867.5 units for one million productions. There are 4 out of 11 processes that cause rejected products, namely Pond, Bending Plate, Spot, Welding. The main cause of Reject is plate Bending with the percentage of total Reject being 48.077%. From the problems that occur, actions can be taken to minimize Reject products in the production process at the company in the form of making improvements to the Pond Process, Plate Bending Process, Spot Process, Welding Process, Machines, Workers, Raw Materials, and Systems that exist in the company.

Keywords : waste, six sigma, DPMO, reject

INTRODUCTION

The company's desire to get maximum results requires company management efforts to continue to be able to develop human resources (HR) in order to be able to compete in the industrial world. One way that can be done by the company to be able to survive in this competition is to increase its productivity. Productivity is generally defined as the relationship between output (goods or services) and input (labor, materials, money). Productivity is a measure of productive efficiency. In the industrial sector, productivity means a relative measure of value or size displayed by productive power (Indarwati, 2019). Productivity also implies a comparison between the results achieved by the role of labor per unit time. Many internal and external aspects support the creation of effective and efficient work productivity within a company. Especially when it is associated with the current problem of globalization whose impact we are feeling.

The company currently uses high-tech machines to support the production process, which aims to achieve effectiveness and efficiency. As technology continues to develop, production also increases. Product productivity is good if it is balanced with good machine operation. In every company, good productivity control must be balanced with good quality as well. Quality / quality is the overall features and characteristics of a product or service that is capable of meeting both obvious and hidden needs (Heizer and Render, 2006).

The XSMK company is a company engaged in the furniture sector that produces various kinds of shelving products in Indonesia. Based on the results of interviews with the main director, this company has a problem that hinders the productivity of the company, namely waste in the production process. Waste can be classified into seven types, namely Waste of Waiting, Overproduction, Overprocessing, Defect, Motion, Inventory, and Transportation (Ohno, 1988).

With the existence of problems at the XSMK Company, this study aims to carry out quality control using the Six Sigma DMAIC (Define, Measure, Analyze, Improve, Control) method. Six Sigma is an organized and systematic method for process improvement strategy and new product development that relies on statistical methods and scientific

methods to make reductions in product defect rates (Behara, 1995). With the Six Sigma method, the company implements a vision of quality improvement towards a target of 3.4 failures per million DPMO opportunities (Defects Per Million Opportunities) for each transaction of goods and services (Kunal, 2012).

The advantages of this method are that it focuses on increasing customer satisfaction, reducing cycle times, and reducing defects. Improvements in these areas will result in dramatic cost savings, opportunities to retain customers, enter new markets, build a reputation for high performance or high-performance products and services (Pande and Holpp, 2003).

Therefore, the Six Sigma method is very suitable for the conditions that occur at the company because this method focuses on suppressing reject products and improving existing productivity. Therefore, with this research it is hoped that the company will get new solutions or breakthroughs that can increase the company's productivity for the better.

LITERATURE REVIEW

Quality Control

Today's increasingly fierce competition in the business world encourages companies to further develop ideas to obtain effective and efficient ways to achieve the goals and objectives that have been set. Companies need a way that can realize the creation of good quality in the products they produce and maintain consistency so that they remain in line with market demands, namely by implementing a quality control system for the process activities undertaken. Quality control is a tool for management to improve product quality when necessary. In carrying out activities, quality control is a technique that needs to be carried out starting before the production process starts, during the production process, until the production process ends with producing the final product. Quality control is carried out in order to produce products in the form of goods or services that are in accordance with the desired and planned standards, as well as improve the quality of products that are not in accordance with. standards that have been set and wherever possible maintain the quality that has been appropriate.

According to Sofjan Assauri in 1998 quality control is an effort to maintain the quality/quality of the goods produced, so that they comply with the product specifications that have been set based on the policies of the company leadership. According to Vincent Gasperz in 2005, quality control is a technique in operations and activities to meet certain needs to achieve certain qualities. According to Reksohadiprojo in 2000 quality control is an important tool for management to improve product quality when necessary, maintain quality, which is already high and reduce the number of damaged goods.

Based on the above understanding, it can be concluded that quality control is a technique and planned activities/actions carried out to achieve, maintain and improve the quality of a product and service so that it conforms to predetermined standards and can meet consumer satisfaction. The objectives of quality control according to Sofjan Assauri in 1998 include trying to keep inspection costs as small as possible, trying to make the design costs of products and processes using certain production qualities as small as possible, trying to keep production costs as low as possible.

The main objective of quality control is to obtain assurance that the quality of the product or service produced is in accordance with predetermined quality standards by spending the most economical or lowest possible cost. Quality control cannot be separated from production control, because quality control is part of production control. Production control both in quality and quantity is a very important activity in a company. This is because all production activities carried out will be controlled, so that the goods and services produced are in accordance with a predetermined plan, where deviations that occur are kept as low as possible.

Quality control also guarantees that the goods or services produced can be accounted for as well as production control. Thus, between production control and quality control is closely related in the manufacture of goods.

Six Sigma

Six Sigma is an almost perfect aim in meeting customer requirements according to Pande and Cavanagh in 2002. Meanwhile, according to Gaspersz in 2005 Six Sigma is a vision of increasing quality towards the target of 3.4 failures per million opportunities for each transaction of goods and services. So Six Sigma is a method or technique of control and dramatic quality improvement which is a new breakthrough in the field of quality management.

Basically, customers will be satisfied if they receive the value they expect. If the product is processed at the Six Sigma quality level, then the company can expect 3.4 failures per million opportunities or expect that 99.99966 percent of what the customer expects will be in the product. According to Gasperz in 2005 there are six key aspects that need to be considered in the application of the Six Sigma concept, namely customer identification, product identification, identification of needs in producing products for customers, process definition, determining the maximum variation of processes for each Critical to Quality / CTQ (determining value maximum standard deviation for each CTQ), and modifying product and/or process designs in such a way as to be capable of achieving the Six Sigma target values.

There are five benefits of implementing Six Sigma for companies, namely getting customer satisfaction, customer loyalty, better profits, employee satisfaction and getting better partnerships (Young & Frank, 2006).

According to Pete and Holpp in 2002, the stages of implementing quality improvement with Six Sigma consist of five steps, namely using the DMAIC method or Define, Measure, Analyze, Improve, and Control. The following are the steps that must be carried out in implementing quality control using the Six Sigma method.

Define is setting goals from Six Sigma quality improvement activities. This step is to define action plans that must be carried out to carry out improvements from each stage of key business processes (Gaspersz, 2005). The responsibility for defining key business processes lies with management. According to Pande and Cavanagh in 2002, the three main activities related to defining core processes and customers are defining the major core processes of the business, determining the key outputs of these core processes, and the key customers they serve, and creating a high-level map of the process. core or strategic process

This definition step is to establish the objectives of the Six Sigma quality improvement activity. At the top management level, the goals set will become the strategic goals of the organization such as: increasing return on investment (ROI) and market share. At the operational level, the target may be to increase production output, productivity, reduce product rejects, operational costs. At the project level, goals can also be similar to the operational level, such as: reducing product rejection rates, reducing machine downtime, increasing the output of each production process.

Measure is a logical follow-up to step define and is a bridge to the next step. According to Pete and Holpp in 2002, the measure step has two main objectives, namely obtaining data to validate and qualify problems and opportunities. This is usually critical information for refining and completing the first project charter as well as starting to tap into the facts and figures that provide clues to the root cause of the problem.

Measure is the second operational step in the Six Sigma quality improvement program. There are three main things that must be done, namely choosing or determining quality characteristics (Critical to Quality), developing a data collection plan, and measuring performance baselines at the output level.

Key Critical to Quality determination must be accompanied by measurements that can be quantified in numbers. This is intended so as not to create perceptions and interpretations that could be wrong for everyone in the Six Sigma project and cause difficulties in measuring reliability quality characteristics. In measuring quality characteristics, it is necessary to pay attention to internal aspects (product rejection rates, costs due to poor quality, etc.) and external aspects of the organization (customer satisfaction, market share, etc.).

Measurement of quality characteristics can be done at the level, namely measurement at the process level (process level) and measurement at the output level (output level). At the measurement at the process level (process level), each step or activity is measured in the process and input quality characteristics submitted by suppliers (suppliers) that control and influence the desired output quality characteristics. At the measurement at the output level, the resulting output quality characteristics are measured from a process compared to the specification of the quality characteristics desired by the customer. How well a product (goods and or services) meets the specific needs and rational expectations of customers is measured.

Because the specified Six Sigma quality improvement project will be focused on efforts to improve quality towards zero defects so as to provide total satisfaction to customers, before the project starts, we must know the current level of performance or in Six Sigma terminology referred to as a performance baseline, so that progress the improvements achieved after starting a Six Sigma project can be measured over the lifetime of the Six Sigma project. Measurement at the output level is intended to determine the extent to which the final output can meet the specific needs of the customer before the product is delivered to the customer.

Analyze is the third operational step in the Six Sigma quality improvement program. There are several things that must be done at this stage, namely determining stability and capability, setting performance targets from Critical to Quality (CTQ) quality characteristics, and identifying sources and root causes of quality problems.

The industrial process is seen as a continuous improvement that starts from a series of cycles from the existence of ideas to produce a product (goods and or services), product development, production/operations process, to distribution to customers. Six Sigma's target is to bring industrial processes that have stability and capability to achieve zero defects. In determining whether a process is in a stable and capable condition, statistical tools will be needed as analytical tools. A good understanding of statistical methods and behavior of industrial processes will continuously improve the performance of industrial systems towards zero defects.

Conceptually setting performance targets in a Six Sigma quality improvement project is very important and must follow the principles:

a. Specific, namely performance targets in a Six Sigma quality improvement project must be specific and stated explicitly.
b. Measurable, performance targets in Six Sigma quality improvement projects must be measurable using appropriate measurement indicators (matrices), in order to evaluate success, review, and corrective actions in the future.
c. Achievable, performance targets in quality improvement projects must be achieved through challenging efforts.
d. Result-Oriented, namely performance targets in a Six Sigma quality improvement project must focus on results in the form of performance improvement that have been defined and determined.

e. Time-Bound, performance targets in a Six Sigma quality improvement project must set a time limit for achieving performance targets for each quality characteristic. (CTQ) Critical to Quality that key and performance targets must be achieved within a predetermined time limit (on time).

To identify problems and find the causes of quality problems, a cause-and-effect diagram or fishbone diagram is used. This diagram establishes ways to make better products and achieve the results (results). This diagram includes man, method, machines, measurement, material, and environment. Man (labor), related to a lack of knowledge, a lack of basic skills due to mental and physical, fatigue, stress, indifference, and others. Method (working method), relating to the absence of procedures and work methods that are correct, unclear, unknown, non-standardized, unsuitable, and others. Machines and equipment, related to the absence of a preventive maintenance system for production machines, including other facilities and equipment that do not comply with the task specifications, are not calibrated, are too complicated, are too hot, and so on. Measurement (measurement), related to errors in using measuring tools, both knife sizes and manual measurements made by workers. Materials (raw materials and auxiliary materials), related to the absence of quality specifications of the specified raw materials and auxiliary materials, the absence of effective handling of these raw materials and auxiliary materials, and others. Environment (environment), related to the conditions that are in the company, especially in environmental conditions such as air circulation and the relationship factors of workers who also affect environmental factors.

In the improve step, an action plan is implemented to implement Six Sigma quality improvement. The plan describes the allocation of resources and priorities or alternatives that are undertaken. The Six Sigma quality improvement team must decide on the targets to be achieved, why the action plan is carried out, where the action plan will be carried out, when the plan will be carried out, who is responsible for the action plan, how to carry out the action plan and how much the implementation costs and positive benefits of implementing the action plan.

The Sigma projection team has identified the sources and root causes of quality problems while monitoring the effectiveness of the action plans that will be carried out over time. The effectiveness of the action plan undertaken will be seen from the decrease in the percentage of COPQ (Cost of Poor Quality) quality failure costs to total sales value in line with the increase in Sigma's capabilities. Ideally, each action plan that is implemented must be evaluated for its level of effectiveness through achieving performance targets in the Six Sigma quality improvement program, namely reducing DPMO (Defects per Million Opportunities) towards a zero-defect oriented target or achieving process capability at a level greater than or equal to 6 -Sigma, as well as converting the benefits of the results into a percentage reduction in the cost of quality failure COPQ (Cost of Poor Quality).

According to Susetyo in 2011, Control is the last operational stage in efforts to improve quality based on Six Sigma. At this stage the results of quality improvement are documented and disseminated, successful best practices in process improvement are standardized and disseminated, procedures are documented and used as standard guidelines, and ownership or responsibility is transferred from the team to the owner or person in charge of the process. There are two reasons for standardizing, namely:

a. If the quality improvement measures or problem solutions are not standardized, there is a possibility that after a certain period of time, management and employees will revert to old ways of working and bring up resolved problems.
b. If the quality improvement actions or problem solutions are not standardized and documented, then there is a possibility that after a certain period of time if there is a change in management and employees, new people will use work methods that will bring back problems that have been resolved by previous management and employees.

METHODS

This research was conducted on the production process at the XSMK Company in Indonesia. With a focus on research on quality control in production lines, especially quality control to overcome the large number of product rejections that occur, the method used for quality control is the Six Sigma DMAIC method.

In this study the type of data used includes primary and secondary data. Primary data is data obtained from original sources through direct field observation and interviews. The primary data obtained in this study is data on the amount of production along with the types of rejects and the number of rejects in the production process for 15 production batches. Secondary data is data obtained indirectly from the object, but through other sources, both orally and in writing. This data was obtained from a literature study in the form of relevant references and literature.

RESULT AND DISCUSSION

Six Sigma as an alternative to quality control principles, the Six Sigma method allows companies to make extraordinary improvements with actual breakthroughs. Six Sigma is an important tool for production management to maintain, improve, maintain product quality and specially to achieve quality improvement towards zero defects. In this study the application of quality control used was the Six Sigma method which went through five stages of analysis namely define, measure, analyze, improve, and control.

Define

Define is the stage of defining quality problems in PT X-Steel Mitra Kontruksindo's products, at this stage what causes the product to experience rejection is defined as the cause. Based on the existing problems, 4 causes of the highest Reject products can be defined, namely: Pond, Bending Plate, Spot, Las.

The first step is to define quality standard problems or define the causes of defects which are the most potential causes in producing products at PT. X-Steel Mitra Kontruksindo. Four processes that often experience problems in producing the final product are identified as follows:

a. Ponds
   In the printing process, quality control that must be considered is related to the Pond Knife, Design problem.
b. Plate Bending
   In the process of Bending Plate quality control that must be considered is related to the problem of the thickness of the material being bent and also the bending profile can be processed with existing equipment or not.
c. Spots
   In the Spot quality control process that must be considered is the duration of time, and also the amount of pressure.
d. Welding
   In the foil process, quality control that must be considered is related to engine and environmental air circulation, workload, electricity source, welding wire, and cleanliness of the work environment.

Next is to define an action plan that must be carried out based on the results of observation and research analysis, namely: a) Improvements to the machine b) Improvement in the quality of the workforce c) Tighter supervision with the right method d) Clearer and more directed work procedures.

Furthermore, setting goals and objectives for improving the quality of Six Sigma based on the results of observations is that the production process at the company requires evaluation to reduce waste in the form of Reject products.

Based on the problem of Reject products that occur in the Pond, Bending Plate, Spot, Welding processes which can cause losses to the company. So, the company must carry out a strategic plan in its operations by reducing Reject products to a minimum with the right actions.

Measures

In carrying out statistical quality control, the first step to be taken is to make the percentage of rejected products in each production batch. The 15 Batches have different production processes according to the product specifications requested by the customer. So that one batch with another does not go through the same process. As for the white cut process, all batches carry out this process in their production process. For the printing process, all batches carry out this process in their production process. Of the 15 Batches that have been shown, it can be seen that the type of reject that often occurs is reject due to bending of the plate with a Reject number of 50. The number of other Rejects is Spot Process 30. The number of other Rejects is Welding Process 23. The number of Rejects is Pond 1 Process. The percentage the highest Reject product was in the 11th batch with 2.67%. Whereas the lowest percentage of Reject products is in the 6th batch with 0%. The average percentage of damage from the 15 production batches is 0.55%.

Six Sigma and Defect Per Million Opportunities (DPMO) level measurement stages to measure the Six Sigma level from the production of XSMK Company, it can be done in the way Gaspersz did in 2007, the steps are calculating Defects Per Unit (DPU), calculating Defects Per Million Opportunities (DPMO), then convert the DPMO (Defect Per Million Opportunities) calculation results with the Six Sigma table to get sigma results.

Table 1. DPU, DPMO, and Six Sigma Value

Batch	Production Amount	Total Reject Products	DPU	DPMO	*Six Sigma*
1	650	6	0,009231	9231	3,86
2	1.140	3	0,002632	2632	4,80
3	1.120	2	0,001786	1786	4,42
4	1.025	17	0,016585	16585	3,63
5	1.000	2	0,002000	2000	4,38
6	200	0	-	-	-
7	2.005	5	0,002494	2494	4,31
8	20.630	20	0,000969	969	5,11
9	3.061	6	0,001960	1960	4,38

Batch	Production Amount	Total Reject Products	DPU	DPMO	*Six Sigma*
10	1.615	1	0,000619	619	5,24
11	150	4	0,026667	26667	3,43
12	3.146	7	0,002225	2225	4,34
13	2.000	25	0,012500	12500	3,74
14	920	1	0,001087	1087	4,57
15	3.596	5	0,001390	1390	4,49
Total	42.258	6	0,009231	82145	60,7
Average			0,005476	5.867,5	4,3357

From the results of the calculations in the table above, the production division of XSMK Company has an average sigma level of 4,336 with a possible damage of 5,867.5 units for one million productions. This is a pretty good number for the company. But the company wanted to increase productivity and reduce the cost of producing failed products. The normal condition of a company has at least a sigma value of ≤ 3.

Analyze

In this analysis the number of process defects will be compared with the total amount of overall damage from the manufacture of the product. The calculation results can be described in the following histogram.

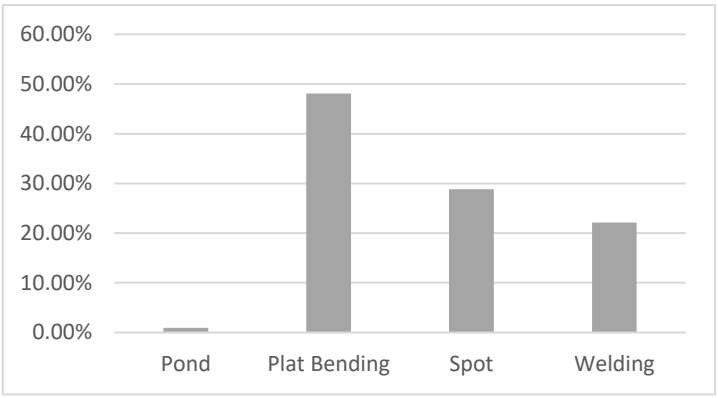

Figure 1. Percentage of Devective Products

From the Histogram above, there are 4 causes for product rejection, namely Pond, Bending Plate, Spot, Las. The most important cause of Reject is Bending Plate with the percentage of total Reject being 48.077% of each batch that has a Bending Plate process in the production process. Another cause is the Spot Process 28.846% of each batch that has a spot process in the production process. Another cause is the Welding Process 22.115% of each batch that has a welding process in the production process. Another cause is the Pond Process 0.962% of each batch that contains the Pond process in the production process.

In the plate bending process, the highest percentage of rejected products is due to the fact that this process is the core of product manufacturing. This process requires many parameters to be considered such as tonnage comparison, material thickness. This greatly affects the product produced, failure in the bending process is usually material that is torn in comparison and also breaks a material, the cause of a broken material is usually too hard of the object being formed. Therefore, the product is rejected after bending the plate less. So that this causes the plate bending process to have a large percentage of rejected products.

The Spot process is the process that has the second highest percentage of rejected products. This process joins two pieces of metal together, but the resulting joint is inadequate for all purposes; it is one of the reject factors in the spot process. In addition, the product is rejected in the spot process caused by the heat of the electric current used is not applied for the correct amount of time to get a strong connection. time and amperage depend on the thickness of the metal being joined.

In the welding process, the cause of rejection is due to internal residual stress, the susceptibility to brittle cracks of the welded joint is greater than that of the rivet joint, and also the complex shape or design of the welding area.

In the pond process, it is the least reject in the production process, the cause of the reject is due to the wrong size of the product to be made, this is usually caused by an inappropriate pond knife. In addition, the human error factor can also cause product rejection in the pond process.

Cause and effect diagrams show the relationship between the problems encountered with possible causes and the factors that influence them. After knowing the types of rejects that occur, XSMK Company needs to take corrective steps to prevent similar damage from occurring. The important thing to do and explore is to find the cause of the damage. As a tool to find the cause of the damage, a causal diagram or what is called a fishbone chart is used. As for the use of causal diagrams to trace the type of each Reject that occurs in each product manufacturing process.

From the results of the cause-and-effect diagram, several factors are obtained in man, method, machine, measurement, material, and environment.

a. Man
   The human factor (Man) plays an important role in causing defects in a product. The reason is because the operator's knowledge is not evenly distributed due to the lack of training provided so that there are operators who are inexperienced, in a hurry when carrying out the production process so that the results are not as expected, and lack of rest for workers causing fatigue which results in decreased worker productivity. and decreased operator concentration so that the operator is not focused when doing work,
b. Machine
   Factors that affect the machine are due to lack of maintenance on the machine, the condition of the old machine so that the machine does not work optimally, and damage to the machine so that the machine does not work optimally.
c. Materials
   Factors of raw materials (materials) that affect the occurrence of product defects, namely because the raw materials used are of poor quality, the raw materials used are brittle and uneven, causing inaccurate product sizes
d. Method
   The influencing factor of the method is that the production process is not in accordance with the procedure, causing the product to be inaccurate, due to errors in the use of tools, and the method used is not appropriate, causing product defects.
e. Measurements
   The measurement factors that affect the appearance of defects in this product are due to errors in measurement, errors in marking measurements, and measuring instruments used that are not clearly visible, causing inaccuracies in measurements.
f. Environment
   Environmental factors (environment) that affect product defects include noisy environmental conditions that affect operator performance in carrying out production process activities, lack of air circulation which causes the air on the production floor to become hot which will affect operator performance, and lack of lighting on the production floor.

Improve

Improve is an action plan to implement Six Sigma quality improvement. After knowing the causes of rejection of the company's products, a recommendation or recommendation for general corrective action is prepared in an effort to reduce the level of product damage as follows:

a. Man
   Based on the identification of the problems that have been made, efforts that can be made to overcome problems originating from the human factor or the operator (man) are by providing training to operators evenly in order to increase knowledge and experience, as well as provide sufficient rest time to increase operator concentration and productivity so that the production results are as expected
b. Machine
   Based on the identification of problems that have been made, efforts that can be made to overcome problems originating from engine factors are by carrying out routine maintenance on the machine to prevent and fix problems before machine or equipment failure occurs, carrying out machine inspections after use, and lubricating parts machinery or equipment that may require it.
c. Materials
   Based on the identification of the problems that have been carried out, efforts that can be made to overcome problems originating from raw material factors are by checking the raw materials sent from suppliers
d. Method
   Based on the identification of the problems that have been carried out, efforts that can be made to overcome the problems originating from the method factor are by carrying out work or production processes according to predetermined methods (according to SOP)

e. Measurements
Based on the identification of problems that have been made, efforts that can be made to overcome problems originating from measurement factors are by focusing more on when taking measurements according to what is desired.

f. Environment
Based on the identification of the problems that have been carried out, efforts that can be made to overcome problems originating from environmental factors, namely by adding the number of windows so that air circulation can be smoothed due to the heat generated from the machines on the production floor, increasing the number of lights on the floor production so that it is brighter so that operators can carry out production process activities properly.

Control

Control is the final analysis stage of the Six Sigma project which emphasizes the documentation and dissemination of the actions taken including carry out joint evaluations every week so that mistakes do not happen again and can be resolved quickly, conduct briefings before carrying out work so as to minimize the occurrence of miss communication and human errors during the production process, carry out periodic maintenance and repair of the machine, supervise raw materials so that the quality of the goods produced is better and avoids damaged products caused by materials, and recording all rejected products every day from each type of production, which is carried out by employees in the production process. So that when there is a reject product it can be immediately recorded and resolved.

CONCLUSSION

The XSMK company has an average sigma level of 4,336 with a probability of damage of 5,867.5 units for one million productions. This is good enough for the company, but the company wants to reduce the cost of producing failed products. The normal condition of a company has at least a sigma value of ≤ 3.

There are 4 out of 11 processes that cause rejected products, namely Pond, Bending Plate, Spot, Welding. The main cause of Reject is plate Bending with the percentage of total Reject being 48.077%. Another cause is Spot Process 28.846%. Another cause is the welding process 21.115%. Another cause is the Pond Process 0.962%. So improvements can be made by focusing on the 4 biggest causes of rejection, namely Pond, Bending Plate, Spot, and Las. This is due to the 4 types of reject that occurred in the company in 15 production batches.

From the problems that occur, actions can be taken to minimize Reject products in the production process at the company in the form of making improvements to the Pond Process, Plate Bending Process, Spot Process, Welding Process, Machines, Workers, Raw Materials, and Systems that exist in the company.

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