

KAIZEN CONCEPT OF APPLICATION AND SIX SIGMA METHOD FOR IMPROVED QUALITY PRODUCTS

Kalammollah¹, Rony Prabowo²

¹ Teknik Pertambangan – Fakultas Teknologi Mineral dan Kelautan

² Teknik Industri – Fakultas Teknologi Industri

Institut Teknologi Adhi Tama Surabaya

INDONESIA

Emails: ¹drs.kalamullah@yahoo.com

ABSTRACT

Application Of Kaizen Concept And Six Sigma method to Improve The Quality Of Product. This study was conducted to investigate the ability of process based on existing defect product using Six Sigma approach that was later controlled by analyzing the cause of defect using Seven Tools and attempting sustainable improvement using Kaizen implementation tools in form of Five M Checklist. After the data was processed, the value of DPMO was obtained for 870 for variant 800 ml and 723 for variant 400 ml that could be defined that in a million opportunities, there were 870 and 723 possibilities that the product had defect. The company was in 4,2 sigma level with CTQ (Critical To Quality) that mostly caused defect, i.e. vertical seal and hanging hole for 32,54 % and 26, 04 % with total defect of 2028 and 7839 units. From the analysis result, it can be concluded that the main cause of defect was human factor, and based on Kaizen implementation tools, the main policy to be implemented by the company was tighter supervision or control in all fields.

Keywords : CTQ, DPMO, six sigma DMAIC, kaizen

INTRODUCTION

In the era of today's global market competition, consumer demand for increased quality of products and services increases. There has also been an increase in product offerings and services with more competitive prices in China, Vietnam, and India (Dale, 2013). One thing that is very significant in improving the performance to meet the challenges of the competition is through continuous improvement on the business activities focused on consumers, covering the whole organization and an emphasis on flexibility and quality. Therefore, the quality and management associated with continuous improvements made by many companies in order to boost the market and win the competition. Companies that do not manage these changes would miss. In line with the organizational paradigm shift from 'market oriented' to 'resource oriented',

then one way that can be taken by the company is to reorganize its resources in order to survive in the long-term competitiveness.

Quality is one of the guarantees given and must be met by the company to customers, including the quality of the product, because the quality of a product is one of the important criteria to be considered customers in choosing products. In addition to the eyes of the customer quality is also one of the important indicators for companies to be able to exist amid intense competition in the industry, therefore, needs improvement and continuous quality improvement of the company in accordance with the specifications and customer needs. Quality control in a product is very important to avoid any defects or discrepancies in the production process that occurred almost every company due to the fact that there is no production process is always good and produce the exact same product, there are always variations of the product. With the quality control, is expected to produce a product that has quality in accordance with the standards set by the company.

One appropriate way is to implement Total Quality Management (Muluk, 2013). Empirically implementation of TQM also recognized very significant in creating a corporate excellence worldwide. Several previous studies have shown that the effective implementation of TQM positively affects: employee motivation (Bey, Nimran, and Kertahadi, 2008); improve employee satisfaction and lowers interest to move the work (Boselie and Wiele, 2011); reducing costs and improving business performance (Huarng and Yao, 2012); managerial performance (Laily, 2013); and improving the quality of human resources (Sularso and Murdijanto, 2014). The approach of TQM also strongly oriented towards people management. The implementation of TQM requires changes in organizational and managerial total and fundamental that include: vision, mission, orientation strategy, and various other vital management practices. TQM implementation relationship with a culture of quality among others described by Hadjosoedarmo (2014), that by implementing the principles of TQM will be created a climate conducive to the realization of a culture of quality as:

1. Rules of behavior of members of the organization will change; after all systems overhaul and leadership is strong enough then the employee is late to be educated and empowered slow sea will show the code of conduct quality and begin to develop good work habits. Rules of good conduct that the employee needs to be preserved by maintaining a conducive work environments.
2. Among the employees will form the attitude of quality, if the code of conduct is always well maintained and reinforced over time through leadership and education system improvement and continuous then internalized by personal attitudes and values conducive to quality. Employees will begin to understand and appreciate why they should take their job right the first time, in addition to good for him is also good for the organization.
3. In the organization can be created a culture of quality. If the attitude of quality has evolved over time and spread among the employees then this change will ultimately towards a culture of quality. This stage usually occurs after several years of implementation of TQM (Cortada, 2003)

Six Sigma methods as one of the most popular new method is an alternative to the principles of quality control is a breakthrough in the field of quality management (Gasperzs, 2005) with the dramatic quality of the advice that has the capability of products and processes 3.4 defects for

every one million defect free activities or opportunities. Six Sigma can be used as a measure of system performance industry that enables companies did a tremendous increase in the actual breakthrough strategies. Six Sigma can also be seen as a process control industry that focuses on customers with notice of process capability. On the other side of Six Sigma has several proven benefits include cost reduction, increased productivity, market share growth, reduction of defects (defects) and the development of production or services. Besides the application of Six Sigma structured where there are 5 steps that must be passed that define, measure, analyze, improve, control (DMAIC). In applying Six Sigma also involve elements of the company in order to be successful Six Sigma implementation to improve the quality of production so as to achieve maximum benefit for the company its self.

PT. Binamandiri Surabaya as one of the companies engaged in manufacturing has also implemented a Total Quality Management since long. This is an appropriate step for PT. Binamandiri Surabaya in improving product quality by prioritizing customer satisfaction. The company also has obtained the certificate of Quality Management System Standard ISO 9001: 2000 and the implementation of Total Quality Management by PT. Binamandiri Surabaya to maximize all the resources and components the company is expected to have a positive impact on employee performance and quality, and more innovative. In the soap products Sunlight variant 800, 400, 200, 85 and 20 ml can not be separated from disability and mismatches on the quality of standard products have been designated, disability dominant more directed at the physical product itself so that the need for identification of factors which lead to disability and a mismatch of product produced and search actions carried out for the maintenance and care and provide the best solution in order to reduce the number of product defects. The variance of the five focus of the research is devoted to product defects variance of 800 ml and 400 ml which had many problems of product defects. The disability among others, such torn (chipped packing), the net does not make standard, top seal, bottom seal, printing is not appropriate, barcode wrong, wrong code fibrate and hanging hole.

From the above background, the necessary implementation of quality control with methods of Six Sigma (DMAIC) assisted with the tools of Six Sigma is checked, sheets, diagrams Pareto, cause and effect diagram, fishbone where the latter obtained defect type whatever is on the product, factor Factors that affect anything that can be done later improvement and controlling to reduce defects or discrepancies in the resulting product. While the concept of Kaizen is used for continuous improvement which means the act of continuous improvement that includes everyone, including managers and workers, these improvements include maintenance and improvement. Maintenance actions include the establishment of policies, regulations bookmark, SOP (standard operation procedure) and supervision while maintenance actions include trainings are done as an addition to insights. From two of these activities we can conclude solutions for maintenance and upkeep at PT. Binamandiri Surabaya. One implementation of Kaizen is implementing 5 S (five-s). Every word S here are the initials of the five words in Japanese, as follows: (1) Seiri meaning quick; (2) Seiton which means tidy; (3) Seiso meaning rehearsal; (4) Seiketsu meaning care; (5) Shitsuke means discipline.

Problem Formulation

How to improve product quality by using the approach of Kaizen and Six Sigma methods

LITERATURE REVIEW

Quality

Quality is a dynamic condition -related products, services, people, processes, environments that meet or exceed expectations. Other ideas on the notion of quality proposed by Triguno (2007) who say that the quality is a standard that must be achieved by a person or group or institution or organization regarding the quality of human resources, the quality of the workings, processes and work or product in the form of goods or services. Thus, satisfactory quality has meaning to being served, both internal and external, in the sense of optimal fulfillment of the demands or requirements of customers or the public.

Six Sigma

Six Sigma is a comprehensive and flexible system for achieving, support and maximize business processes , which focuses on understanding the needs of customers by using facts, data, and statistical analysis as well as continuous attention to the setting, repair and, reviewing business processes (Miranda and Amin, 2012). According Gaspersz (2009) Six Sigma is:

- Pursuit of excellence in customer satisfaction through continuous quality improvement
- Target dramatic qualities which have the capability of products and processes 3.4 DPMO or 99.99966 % defect free
- Sizes indicate how the process of industrial production
- Breakthrough strategy that allows the company increased its outstanding improved bottom (bottom line) through Six Sigma projects
- An approach towards zero failure rate (zero Defects oriented)
- Control focuses on the process industry capability

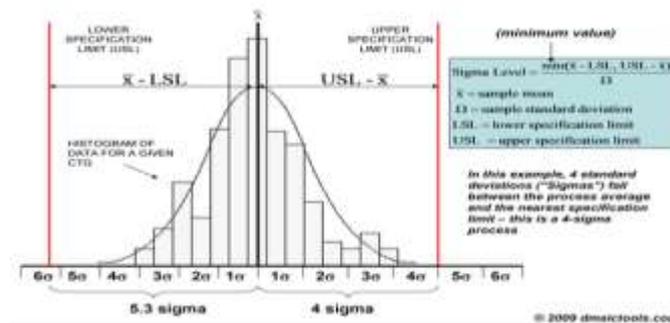


Figure 1. Calculation of Sigma For Specific CTQ

Genba Kaizen

Kaizen (改善) literally comes from the word Kai (改) which means that changes and Zen (善), which means good. Kaizen can be interpreted briefly ie repair or improvement. According to Imai (2001), "kaizen means continuous improvement involving everyone both managers and employees. An essence kaizen is the realization that management should satisfy customers and meet customer needs, if the company wants to continue to exist, profit, and growth. Kaizen has the objective being to improve the quality, process, system, cost, and scheduling for customer satisfaction. The method used in Kaizen to achieve this is by first changing the way employees work so that employees work more productively, not too tiring, more efficient, and safe; second,

fix equipment; Third, improve procedures. The key feature of kaizen approach to management is: (a) Pay attention to the process and not the result; (b) Cross-functional management; (c) Using continuous improvement.

Three basic rules in the application of Kaizen in the workplace is as follows : (1) Setup or Setup or 5S is an element that is essential for good management. Through 5S , employees learn and practice self discipline. Employees without self-discipline is not likely to produce a quality product or service for the consumer. (2) Elimination of waste (muda) Waster are all sorts of activities that do not add value. Waste elimination can be the best way, saving and effective in increasing productivity and lowering operating costs. Kaizen emphasizes the elimination of waste rather than increase investment expected or adds value. (3) Standardization of standards is the best way to carry out a task. Therefore, any product or service is created. Partly the result of a series of processes, the standard would be applied and adhered to at every process involved in order to ensure the quality.

RESEARCH METHODS

The research methodology prepared with the aim to explain the sequence of steps performed in doing a study. The research methodology was made with the aim of solving problems that are the focus of this research can be run in a systematic and purposeful In this chapter, the steps for doing research. And as measures are divided into four stages, as follows: (1) The identification phase; (2) Stage of data collection and processing; (3) Phase analysis and interpretation of results; (4) Conclusions and suggestions. To be able to more easily understand about each stage of the research to be conducted , it is described in more detail as follows :

Phase Identification.

For this first phase covered the background of the problems of this study, then the formulation that's problem occurs materials research, set a goal of research, define the limits and assumptions used in the study and also to be obtained from the research results obtained. For details of each stage there is at this stage are as follows:

- Preliminary Observations Initial observation is useful to look at the object of research before committing further stages and determine the object to be studied. The object can be a place, human and literature (text)
- Problem Formulation Stages formulation of the problem is the most important steps that must be done in a study. Because the formulation will be an issue directly related to the purpose of the determination of the issues
- Objective The research objective is set based on the problems identified in the problem formulation phase.
- Field Study. Field studies need to be done to determine directly the condition of the object to be examined before proceeding to the next stage
- Study Literature. Book study is necessary and no less important to the field of study . From the data obtained through field studies, further dataa - data is processed by the methods used to solve problems that are the focus of this research . And these methods are obtained by reading and studying of the literature that there is such a book , journal , or the thesis of past research.

Phase Data Collection and Processing

At this stage the researchers collected data to obtain information and data of the object to be examined later. Stage define, measure, analyze and control at this stage.

- Define. At this stage of defining the problem and the purpose of this Six Sigma project carried out which at this stage is to identify the product or process what you want repaired and what is critical to quality (CTQ).
 1. Product Identification observed. The data are the focus of observation is a defective product and the data happens in PT. Binamandiri Surabaya;
 2. Identify Critical To Quality (CTQ). Identify the Critical To Quality (CTQ) in the production process in order to determine any existing defects in the product were observed;
 3. Establishment of a Six Sigma team The formation of Six Sigma teams involving people who understand the process of soap production in PT. Binamandiri Surabaya.
- Measure At this stage of the baseline measurements of performance and the sigma value of each process. Later the sigma value will be used as a reference in the improve phase will be done. Sigma value calculation will use the help of a calculator or conversion table sigma Six Sigma.
- Analyse Defining the sources and root causes of the problem were done using the following steps : (a) Identify defects is a major problem with using Pareto diagram; (b) Analysis of the cause of the defect using a causal diagram.

Phase Analysis and Interpretation of Results

Phase analysis of the results is the stage where we will perform an analysis of the results obtained from the data processing. Which will of process analysis and interpretation of the results of the analysis process will be able to answer what the goals of the research. Stage improve and control is done at this stage :

- Improve. Improve phase is done after finding out the root cause of the problem, then proceed with the input into the preparation of the kaizen with five M checklist and five step plan which this proposal will be planned and implemented in order to reduce the problems.
- Control. Control is done after showed significant improvement at this stage, if the proposed improvements are given and provide positive outcomes or reduce existing CACT then phase control continues.

Conclusion Phase

From the analysis that has been done it can be given based on the conclusion that the focus of research as well as providing advice on this research activity.

DISCUSSION

Define Phase

Define the first operational step in the Six Sigma quality improvement in the DMAIC method. The purpose of this phase is to identify products define observation and formation of Six Sigma

teams. Then do the defining character of CTQ (Critical to Quality) forming the quality of the products selected.

- Product Identification observations. Based on the company policy given to the researchers, this study is the product of Quality Control soap packaging process , especially in 800 ml and 400 ml , because the number of defects generated in the process is relatively very high . Based on production data , then the purpose of six sigma project is to reduce the level of disability arising processed packaging greatest experience of disability .
- Six Sigma Team

Table 1. Six Sigma Team

Team	Number s	Role
Kalamullah Rony Prabowo	2	Running groove in the methods of Six Sigma DMAIC
Syarif Huda (Quality Control Staff)	1	As the competent authority or authorities in Quality Control
Heru Wiryawan (Production and Engineering Staff)	1	The competent authorities in the regulation process
Abdul Yadi and Edi Soeparto (Support Team)	2	Conducting production, measuring and collecting data in the field

Table 2. Quality Characteristics Definition

No.	Quality Standard	Quality Characteristics	Description
1.	Packing Esthetics	Production Code	clearly legible and there
		FIB Code	clearly legible and there
		Puncher Hole	attached between the two sides
		Golfing	arch formed according to standard
2.	Sealing Quality	Top Seal	15 mm + 1 mm Bottom Up
		Bottom Seal	5 mm 2 mm outer and inner
		Vertical Seal	12 cm + 1 mm outer side
		Sealing	pouch wrinkled or not
3.	Capacity	Number In Fib	12 pcs for 800 ml and 24 pcs for 400 ml
		Netto	821-830 g for 800 ml and 402-412 g for 400 ml

Measure Phase

Measure is a second operational step in the Six Sigma quality improvement. At this stage it will do data collection plan that serves to filter out the problem and examine the root of the problem and will be processed and used as a baseline performance. The steps that must be taken:

Table 3. Control Limit Established

Period e	N	Np	P	LCL	CL	UCL	CP
03-11-14	100	43	0.4300	0.004	0.4510	0.8980	0.3465
04-11-14	150	56	0.3733	0.0779	0.4510	0.8241	0.3331
05-11-14	100	49	0.4900	0.004	0.4510	0.8980	0.3041
06-11-14	100	45	0.4500	0.004	0.4510	0.8980	0.3311
07-11-14	150	67	0.4467	0.0779	0.4510	0.8241	0.2784
08-11-14	150	66	0.4400	0.0779	0.4510	0.8241	0.2827
09-11-14	120	65	0.5417	0.0766	0.4510	0.8254	0.2304
11-11-14	120	49	0.4083	0.0766	0.4510	0.8254	0.3056
12-11-14	150	76	0.5067	0.0779	0.4510	0.8241	0.2455
13-11-14	200	89	0.4450	0.0796	0.4510	0.8224	0.2782
14-11-14	150	67	0.4467	0.0779	0.4510	0.8241	0.2784
Total	1490	672					

$$LCL : 0.0966 - 3 \sqrt{\frac{0.0966(1-0.0966)}{100}}$$

$$CP = \frac{UCL-LCL}{6\sigma}$$

$$UCL : 0.0966 + 3 \sqrt{\frac{0.0966(1-0.0966)}{100}}$$

$$DPMO = \frac{\text{(Number of Defects X 1,000,000)}}{\text{((Number of Defect Opportunities/Unit) x Number of Units)}}$$

Example:

A manufacturer of computer hard drives wants to measure their Six Sigma level. Over a given period of time, the manufacturer creates 83,934 hard drives. The manufacturer performs 8 individual checks to test quality of the drives. During testing 3,432 are rejected.

Defects	2028
Opportunities	475200
Defect Opportunities per unit	5

DPMO	853.5354
Sigma Level	4.8

Figure 2. DPMO Calculate

Baseline Performance

DPMO = [Defect Units/ (Production Units x Numbers of CTQ)] x 1.000.000

DPMO = [7839 / (1900800 x 5)] x 1.000.000 = 4124

Sigma = Normsinv [(1.000.000 – DPMO) / 1.000.000] + 1,5

Sigma = Normsinv [(1.000.000 – 4124) / 1.000.000] + 1,5 = 4.14 = 4.2

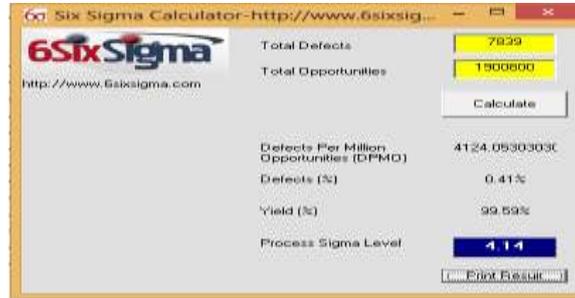


Figure 3. Six Sigma Calculate

Analyze Phase

Table 3. CTQ Analyze

Date	Units of Production	Total Reject	CTQ	Description
July, 11 2016	43200	217	5	All kinds of defects that exist in variants of 800 ml
July, 12 2016	43200	172	5	
July, 13 2016	43200	181	5	
July, 14 2016	43200	184	5	
July, 15 2016	43200	180	5	
July, 16 2016	43200	217	5	
July, 17 2016	43200	158	5	
July, 18 2016	43200	192	5	
July, 19 2016	43200	176	5	
July, 20 2016	43200	169	5	
July, 21 2016	43200	182	5	
Total	475200	2028	5	

Table 4. Defect Cumulative

Defects	F	F. Cum	P	P.Cum
Golfing	144	144	7.10	7.10
Sealing	300	444	14.79	21.89
Top Seal	408	852	20.12	42.01
Bottom Seal	516	1368	25.44	67.46
Vertical Seal	660	2028	32.54	100
Total	2028		100.00	

Table 5. Establish Root Cause Problems Defective Product

No.	Factors	Cause	Effect
1.	Human	The operator does not comply with SOP	Vertical seal and hanging hole
		Operator will indifferent quality of product	
		Operator bored, sleepy and joking	
2.	Machine	Heater seal too hot so easily melt seal	Vertical seal
		Heater seal does not reach the target temperature so that the seal is not attached	
		Component seals are broken heater	
		Cutting a hole hanging thump	Hole hanging
		Engine overheating	
		Sensor hanging hole cutting error	
3.	Methods	No Standard Procedure	Vertical seal and hanging hole
		The procedures are not updated	
		Less stringent inspection	
4.	Material	Material dirty	Vertical seal
		Lack of good quality material	
5.	Environment	Lack of staff awareness of cleanliness	Vertical seal and hanging hole
		The condition of the rooms were noisy	

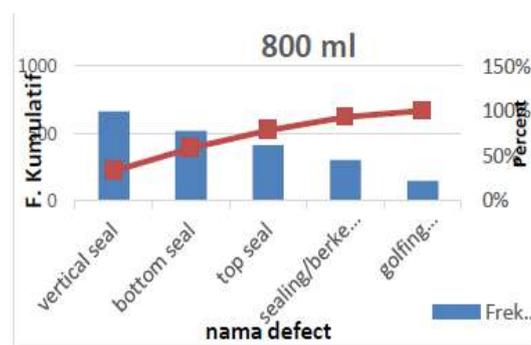


Figure 5. Hitogram of Product

Improve Phase

The fourth phase in the DMAIC cycle is the improve phase. In the improve phase made corrective action plan and improvements to eliminate the root of the root cause of the failure. Steps include: establish the root causes of product defects, outlined the steps kaizen with M Five - Step Plan Checklist and 5 . The step can be seen below:

Develop Measures Kaizen

Once the cause of the defect sources of the problem is identified, it is necessary to the determination of corrective action plan (action plan) to address and follow up on existing problems in order to reduce the number of defects in each process . Basically the action plan describe the allocation of resources and alternative priorities undertaken in the implementation of the action plan.

1. Seiri (Brief) Seiri means sorting and grouping items according to type and function, making it clear where necessary and which are not required . The situation is all the goods and materials sector in an area cluttered with mixed erratic so it is not clear what is important and what is not important. As a result : (a) Workers difficult to find the desired item; (b) A waste of time to find the necessary items; (c) Motion disrupted work; (d) Materials and goods are not guaranteed quality

Implementation of sorting namely : (a) Separating the necessary items with goods that are not needed; (b) Separating and classifying goods and materials according to their importance; (c) Separating then save or discard unnecessary items

Goods that are not required are: (a) Machines or appliances damaged work; (b) Machinery or work tools that are not used or is not appropriate; (c) Other items that have nothing to do with work.

2. Seiton (Neat). Seiton means preparing and laying of materials and goods in accordance with the place so easily found back or reach when needed. The situation is all the stuff piled carelessly placed in any places or documents that accumulate in table or cabinet without adequate preparation. As a result of this : (a) To find items takes a long time, resulting in a waste of time; (b) Production preparation time is not effective, the person or related parts waiting consequently reduced production; (c) It is hard to find when needed; (d) Possible missing or tucked big enough.

Objects that should be organized: (a) Work equipment; (b) Raw materials and auxiliary materials; (c) Spare parts and accessories

Objective implemented : (a) Workplace neat; (b) The layout and placement of efficient; (c) Increase productivity in general by eliminating waste time in searching for items or while going to do something.

The steps that must be taken toward neatness : (a) Map placement of goods; (b) Identification of goods; (c) Marking; (d) Site preparation; (e) Grouping items

3. Seiso (Rehearsal). Seiso means cleaning all the facilities and working environment of the feces and dispose of waste in place. For example : cutting pouch packaging wastes during

work activities go unpunished , for example, there is a former oil attached to the machine or working equipment. As a result of this, namely : (a) The work environment becomes uncomfortable; (b) Pollute the environment; (c) Damage to the working tools; (d) Lowers productivity.

The purpose of cleaning : (a) Determining minor problems by monitoring the cleanliness; (b) Understand that the cleaning is checked; (c) The level of cleanliness in accordance with the need for achieving nil.

4. Seiketsu (Maintenance)

Seiketsu means maintaining all of the goods or equipment, clothing, workplace and other material kept in clean and orderly condition. This stabilization was a result of the selection, arrangement and cleanliness are implemented accurately and repeatedly. In this stabilization, there should be standardization of the selection, arrangement, and cleanliness. Besides it is an important step in the execution of standardization that is not littering and cleanliness make a schedule to create a governance board maintenance system (house keeping). Implementation of consolidation: (a) Providing a sign of danger areas; (b) Make directions; (c) Placing the warning color; (d) Setting up security; (e) Make manual fire extinguisher.

Some steps Seiketsu : (a) The pattern of the follow-up inspection; (b) Watching; (c) Determination of the conditions are not fair; (d) Determination of the quality control

5. Shitsuke (Diligent)

Shitsuke means to shape attitudes to meet or comply with the rules and disciplines of the cleanliness and tidiness of the equipment and the workplace. In habituation target to be achieved is the establishment of an independent attitude, system recognition of the work that has been successfully carrying out 4 S successfully. Some of the factors that help implement Shitsuke are : (a) Implement activities together; (b) Making time to practice; (c) Organizing practices memunggut goods or dispose of waste in place; (d) The habit of using safety equipment; (e) Implementing the practice of emergency; (f) Implement individual responsibility

Steps Shitsuke : (a) Learning opportunities for employees; (b) employee relations; (c) Exemplary of superiors; (d) Target setting together

Phase Control

Phase Control is the final stage of the DMAIC cycle. Which at this stage will be monitoring the process to determine whether the improvements that have been.

Table 6. Sig Sigma Value of Product 800 ml

Date	Unit of Production	Total of Reject	CTQ	DPMO	Sigma
July, 25 2016	43200	24	5	556	4.8
July, 26 2016	43200	60	5	1389	4.5
July, 27 2016	43200	48	5	1111	4.6
July, 28 2016	43200	33	5	764	4.7
July, 29 2016	43200	23	5	532	4.8
Total	216000	188	5	870	4.5

Table 7. Sig Sigma Value of Product 400 ml

Date	Unit of Production	Total of Reject	CTQ	DPMO	Sigma
July, 25 2016	172800	216	6	1250	4.6
July, 26 2016	172800	96	6	556	4.8
July, 27 2016	172800	121	6	700	4.7
July, 28 2016	172800	96	6	399	4.9
July, 29 2016	172800	96	6	399	4.9
Total	864000	625	6	723	4.7

originally 4.2 to 4.5 (higher is better), and a reduction in the original 4268 DPMO be 870. As for the variants capability Sigma 400 ml original value is 4,2 to 4.7 and DPMO original 4124 into 72

CONCLUSION

Based on the results of data processing and data analysis that has been done before it was concluded among others as following:

1. From the analysis of the quality improvement process variant packs of 800 ml of 5.4 sigma value obtained with a value of 5.1 and variants DPMO 400 ml of 5.4 sigma value obtained with a value of DPMO 4.3.
2. The quality characteristics or Critical To Quality (CTQ) to 800 ml variants there are five kinds. After processing the data can know the percentage of each type of CTQ of 800 ml variant is sealing/wrinkled, top seal, bottom seal, seal vertical and golfing. As for the 400 ml variants there are 6 types include sealing/wrinkled, top seal, bottom seal, seal vertical, hanging hole and golfing.
3. Proposed quality improvement by means of kaizen implementation tool that is with a five-m checklist among others, to the human factor given directives in carrying out the work order accuracy in work can be improved, there should be even more stringent supervision, need to be given CCTV surveillance; to factor adjustment engine heater seal locked, inspection every 15 minutes, a modification to the hole puncher, resetting the sensor; to factor methods do meetings for standardization of working methods, procedures and submit a long job to be updated; to clean and trim material factors.
4. The storage of material, create a checklist so that results could be known party checklist production; and environmental factors that the company needs to conduct an evaluation of comfort at work and provide earplugs to every operator to minimize noise.

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