PROPOSED IMPROVEMENT TO REDUCE POTENTIAL FAILURE PRODUCT DEFECTS IN THE MACHINE CENTER, TOSHIBA BMC-100 (5) USING FAILURE MODE AND EFFECT ANALYSIS AT PT. DIRGANTARA INDONESIA

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ABSTRAK

PT. Dirgantara Indonesia is a State-owned company engaged in the field of aerospace, namely the manufacture of aircraft, in the manufacture of airplanes PT. Dirgantara Indonesia has various types of production machines, one of which is machine Center, Toshiba BMC-100 (5).. This machine produces a component of file types for Boeing, because the age of the machine was too old, common product defects (rejects) on the production process of the engine Center, Toshiba BMC-100.

With the need for an analysis of the good maintenance to address the damage that occurred in the machine. Method of FMEA (Failure Mode and Effect Analysis) method is aimed at evaluating the system taking into account the various types of failure of the system which consists of component parts, analyzing the influence-influence system reliability with failure influences search components in accordance with the level of specialized items of critical systems can be assessed and the necessary actions to correct the failure.

Based on the results of the research that has been done is obtained that the components of the engine machine Center, Toshiba BMC-100 (5). which results in a defect (reject) undercuted, damaged, undersized products and ANGEL FWD SUPORT, FORK FITTING, CLEAT SHEAR, and JOIN the LOWER STRAP. Stages in determining where the most influential component of failure on the production machines, Toshiba BMC-100 (5) determine the most dominant defect using the pareto diagram, determine the failure occurs using the fishbone diagram, determine the effect of component damage, assessing the effects of the damage, assessing the frequency of causes of damage, and the probability of detection. The results of calculation by the method of RPN (risk priority number,) and a FMEA work sheet with RPN value of 180 means, maintenance actions need to be performed on the components of the blunt cutter so as not to lead to disability (rejects) on the product.

keywords: *Maintenance*, FMEA *(Failure Mode and Effect Analysis)*.

I. Introduction

A. Latar Belakang Masalah

In principle, PT. Dirgantara Indonesia is a State-owned company operating in the aerospace field, namely the manufacture of aircraft. In making airplanes PT. Dirgantara Indonesia Have various types of machine production one of them is the Toshiba machine Center, BMC-100 (5). This machine produces a component of file types for plane Boeing. The workings of these CNC machines the workpiece in cut out by the chisel that rotating and the control of movement is regulated by a computer through the program. To maintain the product quality and the reliability of the production machine, then the required handling a good care so that the not occur problems on machines which resulted in production become distracted.

From the explanation above, one of the problems or obstacles faced by PT Dirgantara Indonesia in the production process that is, often the occurrence of defective product (resist) on the production process of the machine Center, Toshiba BMC-100 (5). The problem of attempts are made to identify and evaluate potential failures as well as their impact, can be analyzed using FMEA (Failure Mode and Effect Analysis).

The selection method of the FMEA (Failure Mode and Effect Analysis) were conducted because this method aims to evaluate and identify system design. With taking into account the various types of failure of systems consisting of components, analyse the influence-influence system reliability with find influences failure components in accordance with the level of critical system, so it could be assessed and acquired the necessary actions to improve the design or production process, on a machine Center, Toshiba BMC-100 (5).

B. Identification Problem

Based on the background described above, then the identified problem, namely:

1. What causes problems on the production process of the engine Center, Toshiba BMC-100 (5)?
2. What causes product produced Machine Center, Toshiba BMC-100 (5) became disabled?

C. Research Objectives

The purpose of this study is as follows:

1. What causes problems on the production process of the engine Center, Toshiba BMC-100 (5)?
2. What causes product produced Machine Center, Toshiba BMC-100 (5) became disabled?

II. Basic Theory

A. Understanding Maintenance

The treatment is a conception of all the activities required to keep or maintain the quality of the equipment in order to still be able to function properly as in previous condition. (Supandi, 1999: 25-26). The role of the new maintenance will be very pronounced when the system began to suffer from a disorder or not can be operated again. The problem of this treatment is often overlooked because of the large number of expensive or expenses incurred in its execution, but when compared with a loss of time unemployed due to a malfunction of the machine far greater than the cost of care and will be felt when the system started experiencing interruptions in operation, so smooth and continuity of production will be disrupted. Maintenance may also be defined as an activity to take care of the facilities so that such facilities are in a ready to use condition according to your needs. In other words, care is an activity in order to seek production facilities are on the desired ability or condition. In addition, the treatment is a combination of a wide range of actions aimed at maintaining a system in the desired condition. Maintenance issues have a very tight relationship with damage precautions (preventive) and repair damage (corrective).

B. FMEA *(Failure Mode and Effect Analysis)*

On the pelaksanaanya this method is very good in helping companies because with this method the company may identify damage to components engine, search for potential causes and consequences arising as well as other bad effects and can also perform actions that must be carried out according to the procedure or method of FMEA. With FMEA methods companies can perform the procedure with regular engine maintenance, so damage to the system or the machine suddenly can soon be overcome. FMEA also is a method for identifying and researching how to avoid breakage or failure on the system, whether the damage caused by the operator (man), machines, materials and also the environment. *Failure Mode and Effect Analysis (FMEA) is a systematic design techniques to identify and menginvestasi systems that are likely to develop (product/process) is bad, this is in line with the methodology for testing measures system where damage could occur. The potential effects of the system's performance and security from damage and other serious effects.* FMEA consists of two different analysis, i.e. the type of damage and impact analysis (FMEA), where everything is expanded to analyze the types of critical damage, called the analysis of the inquiries (CA). Real advantage above the other from action identifier or change the elimination or reduce the chance of breakage.

FMEA also enhances the knowledge of the system and improve the preparation into the expected behavior, the output of an FMEA is done at the right time which is derived from invaluable input to increase the cost of an effective preventive maintenance program and the work focused on the control plan. FMEA begins with the stage of conceptual and design preparation, when the system is analyzed more than a functional perspective. To maximize effectiveness, however the analysis necessary to increase any additional information that is available to an analysis, it also reflects all changes to the design and its impact on the overall system. Beside that, and Additionally, the advantages or benefits increasingly clear with FMEA, it can make an important contribution towards a feasibility study of the system throughout the preparation phase of the design and functional problems depictions.

Judging ugliness of damage. In the context of the analysis of these connect with the effect or cause serious damage to the type umunya. Identify damage detection means, in this context, a process orientation with FMEA, control flow refers to the process that is able to detect the occurrence of failure or defect. However, when the FMEA focuses on the design of this show at the existence of some type of design, support, size, readability or verification procedure will detect the results of this type of damage potential.

Characteristics of damage from any machine or equipment will affect the shape of the approaches used in solving problems. Characteristics of damage from each machine are generally not the same, because a machine or equipment operated on different conditions with the load and the working time varies.

C. 5W1H

5W-1h is a method used to find out the problems occurred in detail is also used to find the root cause of the problem. Several questions, namely: what, who, where, when, why and how (what, who, where, when, why and how) and is usually presented in the form of tables.

III. Results and Discussion

This step is performed to identify the cause of the occurrence of the problems at the company PT. Dirgantara Indonesia, using the flowchart as a basis to analyze problems that occur.

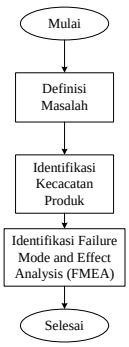


Image 1. *Flowchart*.

A. Determine the dominant Defects in products

At this stage the present dominant defect product, aiming to find out the type of disability that most of the products. As for the dominant defect table table 1:

Table 1. The predominant Disability percentage for each products.

Nama Produk	Jumlah Produk Jadi	Jumlah Produk Cacat	Presentase %	Presentase Cacat Komulatif%	Jenis Cacat
ANGLE FWD SUPPORT	40	12	36,36%	36,36%	*Undercuted*
FORK FITTING	20	10	30,30%	66,67%	*Undercuted*
CLEAT SHEAR	18	8	24,24%	90,91%	*Damaged*
JOINT STRAP LOWER	16	3	9,09%	100%	*Undersized*
Total	**94**	**33**			

B. Pareto Diagram

This phase presents the dominant defect data products, aiming to find out the type of defect which is the greatest of the four products are as follows:

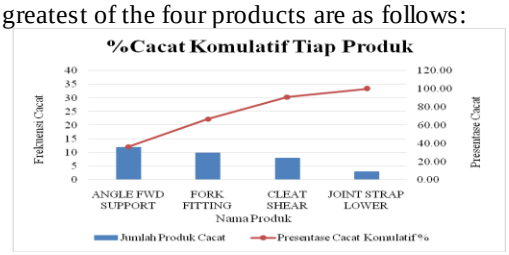


Image 2.Pareto Diagram.

C. Fishbone Diagram

1. The following is a diagram of cause and effect for the ANGEL FWD SUPPORT product type of defect undercuted.

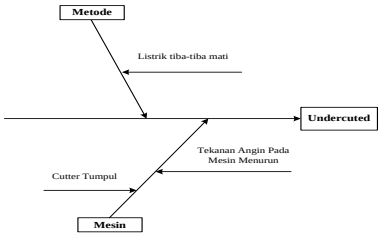


Image 3. Cause and effect diagram for product ANGEL FWD SUPPORT.

2. The following is a diagram of cause and effect for the FORK FITTING product fits the type of defect undercut.

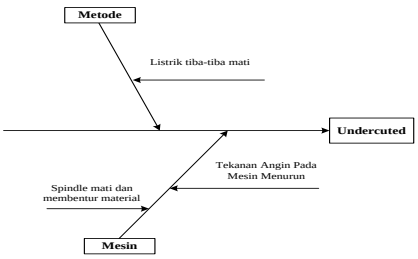


Image 4. Cause and effect diagram for product FORK FITTING.

3. The following is a diagram of cause and effect for the CLEAT SHEAR product type of defect *Damaged*.

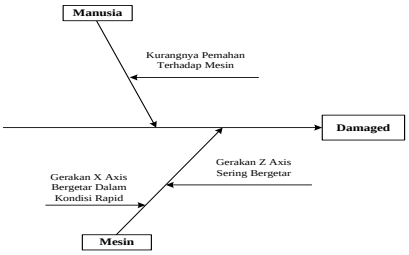


Image 5. Cause and effect diagram for product CLEAT SHEAR.

4. The following is a diagram of cause and effect for the JOIN STRAP LOWER product type of defect *Undersized*.

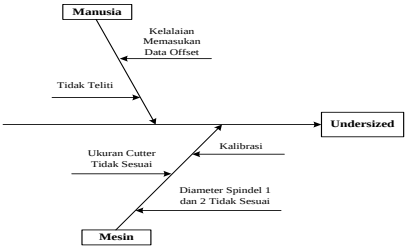


Image 6. Diagram . Cause and effect diagram for product STRAP LOWER

D. Determine the effects of damage to Engine Components Center, Toshiba BMC-100 (5)

This step is performed to find out the effect of damage of machine components Center, Toshiba BMC-100 (5) which have an impact on the quality of the product.

Table 2. Effect Of the components of the Machine Center, Toshiba BMC-100 (5).

Nama Komponen/Proses	Efek Terhadap Sebuah Proses
Cutter tumpul	Produk Cacat/*Reject*
Tekanan angin dari mesin Center, Toshiba BMC-100(5) menurun	
Gerakan X axis bergetar pada saat *rapid*	
Diameter *spindle* 1 dan 2 tidak sesuai	
Spindle mati dan membentur material	
Gerakan Z axis sering bergetar	
Ukuran *cutter* tidak sesuai	

E. Assessing the effects of Ugliness and the type of Damage

In assessing the ugliness of the production process can be seen from the extent of the defects generated by components engine Center, Toshiba BMC-100 (5), and led to the ugliness of machine functions and inhibit the working of the machine. There are two kinds of judgment about the ugliness of damage types such as:

1. Assess the ugliness of damage type of process
2. Assess the type of ugliness towards the customers

- Assess type of ugliness at process:

Table 3. The level of ugliness the process of each component of the engine Center, Toshiba BMC-100 (5).

Nama Komponen/Proses	Keburukan Terhadap Proses	Tingkat
Cutter tumpul	*Very high*/Sangat tinggi; Gangguan pada proses produksi, mempengaruhi proses berikutnya	10
Tekanan angin dari mesin Center, Toshiba BMC-100(5) menurun		9
Gerakan X axis bergetar pada saat *rapid*		9
Diameter *spindle* 1 dan 2 tidak sesuai		9
Spindle mati dan membentur material	*High*/Tinggi; Gangguan mempengaruhi proses produksi menjadi terganggu karena sistem yang tidak bisa dioperasikan.	8
Gerakan Z axis sering bergetar	*Very high*/Sangat tinggi; Gangguan pada proses produksi, mempengaruhi proses berikutnya	9
Ukuran *cutter* tidak sesuai	*High*/Tinggi; Gangguan mempengaruhi proses produksi menjadi terganggu karena sistem yang tidak bisa dioperasikan.	8

- Assess type of ugliness towards the customers

Table 4. The level of ugliness against the customer from the components of the engine Center, Toshiba BMC-100 (5).

Nama Komponen/Proses	Keburukan Terhadap Pelanggan	Tingkat
Cutter tumpul	*Very high*/ Sangat tinggi; Tingkat keburukan ketika jenis kerusakan yang potensial mempengaruhi keamanan fungsi sistem.	10
Tekanan angin dari mesin Center, Toshiba BMC-100(5) menurun	*High*/Tinggi; Berarti ketidak puasaan pelanggan terhadap kerusakan seperti sistem yang tidak bisa dioperasikan, bagaimana tidak, keamanan sistem dilanggar atau gagal.	8
Gerakan X axis bergetar pada saat *rapid*	*High*/Tinggi; Berarti ketidak puasaan pelanggan terhadap kerusakan seperti sistem yang tidak bisa dioperasikan, bagaimana tidak, keamanan sistem dilanggar atau gagal.	8
Diameter *spindle* 1 dan 2 tidak sesuai	*Moderate*/Sedang; Sedang berarti penyebab kerusakan mengakibatkan ketidak puasan pada pelanggan. Gangguan terhadap kerusakan, pelanggan akan melihat keburukan pada sub-sistem dan performansi.	6
Spindle mati dan membentur material	*Moderate*/Sedang; Sedang berarti penyebab kerusakan mengakibatkan ketidak puasan pada pelanggan. Gangguan terhadap kerusakan, pelanggan akan melihat keburukan pada sub-sistem dan performansi	5
Gerakan Z axis sering bergetar	*High*/Tinggi; Berarti ketidak puasaan pelanggan terhadap kerusakan seperti sistem yang tidak bisa dioperasikan, bagaimana tidak, keamanan sistem dilanggar atau gagal.	8
Ukuran *cutter* tidak sesuai	*High*/Tinggi; Berarti ketidak puasaan pelanggan terhadap kerusakan seperti sistem yang tidak bisa dioperasikan, bagaimana tidak, keamanan sistem dilanggar atau gagal.	7

F. Assessing The Frequency of Causes of Damage

The frequency of occurrence of the failure of a product provides an overview of a system that is often damaged, making known the intensity of damage that occur from each component of the engine Center, Toshiba BMC-100 (5).

Table 5. Level of Frequency of occurrence type of damage From each component of the engine Center, Toshiba BMC-100 (5).

Nama Komponen/Proses	Frekuensi Kejadian Jenis Kerusakan	Probabilitas Kerusakan	Tingkat
Cutter tumpul	*Very high*/Sangat tinggi; Kerusakan yang hampir tidak bisa diacuhkan/dibiarkan	4 Kali dalam 1 tahun = 0,333	9
Tekanan angin dari Mesin Center, Toshiba BMC-100(5) menurun			9
Gerakan X axis bergetar pada saat *rapid*	*High*/Tinggi; Kerusakan tidak dapat dihindari	3 Kali dalam 1 tahun = 0,25	8
Diameter *spindle* 1 dan 2 tidak sesuai			8
Spindle mati dan membentur material	*High*/Tinggi; Kerusakan tidak dapat dihindari	2 Kali dalam 1 tahun = 0,167	7
Gerakan Z axis sering bergetar	*High*/Tinggi; Kerusakan tidak bisa dihindari	3 Kali dalam 1 tahun = 0,25	8
Ukuran *cutter* tidak sesuai	*High*/Tinggi; Kerusakan tidak dapat dihindari	1 Kali dalam 1 tahun = 0,083	7

G. Assessing The of Detection Probability

Assess probability of damage from each component of the engine Center, Toshiba BMC-100 (5) is a design or procedure to detect the type of damage potential, at the appropriate time on the system. This is done to see how great the extent of damage that must be detected so that the damage can be immediately resolved.

Table 6. Detection Probability Of each component of the engine Center, Toshiba BMC-100 (5)

Nama Komponen/Proses	Deteksi Probabilitas	Tingkat
Cutter tumpul	*Very high*/Tinggi; berarti kemampuan alat kontrol untuk mendeteksi bentuk dan penyebab kegagalan potensial sangat tinggi/mekanisme untuk mendeteksi modus kegagalan berikutnya	2
Tekanan angin dari Mesin Center, Toshiba BMC-100(5) menurun	*High*/Tinggi; berarti kemampuan alat kontrol untuk mendeteksi bentuk dan penyebab kegagalan potensial tinggi	3
Gerakan X axis bergetar pada saat *rapid*	*Moderate*/Sedang; berarti kemampuan alat kontrol untuk mendeteksi bentuk dan penyebab kegagalan potensial sedang, mekanisme untuk mendeteksi modus kegagalan berikutnya	6
Diameter *spindle* 1 dan 2 tidak sesuai	*Low*/Rendah; berarti kemampuan alat kontrol untuk mendeteksi bentuk dan penyebab kegagalan rendah, mekanisme untuk menedeteksi modus kegagalan berikutnya	7
Spindle mati dan membentur material	*Moderate*/Sedang; berarti kemampuan alat kontrol untuk mendeteksi bentuk dan penyebab kegagalan potensial sedang, mekanisme untuk mendeteksi modus kegagalan berikutnya	5
Gerakan Z axis sering bergetar	*Moderate*/Sedang; berarti kemampuan alat kontrol untuk mendeteksi bentuk dan penyebab kegagalan potensial sedang, mekanisme untuk mendeteksi modus kegagalan berikutnya	5
Ukuran *cutter* tidak sesuai	*Low*/Rendah; berarti kemampuan alat kontrol untuk mendeteksi bentuk dan penyebab kegagalan rendah, mekanisme untuk mendeteksi modus kegagalan berikutnya	7

H. Calculate The RPN (Risk Priority Number)

RPN is the value that is used to determine which of the components that have top priority for actions performed treatments. Assessment of the results obtained from the RPN times between ugliness of damage type, the frequency of occurrence of damage and value of detection probability. RPN can be found in the following table, with the following equation:

RPN= (Efek Kerusakan) x (Frekunsi Penyebab Kerusakan) x (Deteksi Probabilitas)

Figure 7. Equation Of The RPN (Risk Priority Number)

Table 7. Risk Priority Number (RPN) for each component of the engine Center, Toshiba BMC-100 (5).

No	Nama Komponen/Proses	Efek Kerusakan	Frekuensi Penyebab Kerusakan	Deteksi Probabilitas	RPN
1	*Cutter* tumpul	10	9	2	180
2	Tekanan angin dari Mesin Center, Toshiba BMC-100(5) menurun	9	9	3	243
3	Gerakan X axis bergetar pada saat *rapid*	9	8	6	432
4	Diameter *spindle* 1 dan 2 tidak sesuai	9	8	7	504
5	*Spindle* mati dan membentur material	8	7	5	280
6	Gerakan Z axis sering bergetar	9	8	5	360
7	Ukuran *cutter* tidak sesuai	8	7	7	392

I. FMEA *(Failure Mode and Effect Analysis)*

FMEA is a method that aims to identify and evaluate the design of the system taking into account the various types of damage of the system consists of component parts, analyzing the influence-influence system reliability with damage influences the search component in accordance with the level of specialized items of critical systems can be assessed and the necessary actions to improve the design and eliminate or reduce the probability of the methods to critical damage. In FMEA to be performed a calculation of Risk Priority Number (RPN), which is the multiplication of Occurance (O), Severity (S), Detectability (D), by giving the value subjectively between 1-10 as the message. The data required to create a FMEA is causal factors from fishbone that was created earlier. Below is a table of the disability causes FMEA Undercuted, Damaged, Undersized and caused by components engine Center, Toshiba BMC-100 (5). Below we can see in the table of process FMEA as follows:

Table 8. Process FMEA

Nama komponen: Komponen Mesin Center, Toshiba BMC-100(5) No Mesin : AGBB01 Oleh : Ari Noor P

Produksi : *Part* Sayap Pesawat Airbus A380 Tgl produksi : 11/02/2013 FMEA: 01/01/2013

Tabel 4.14 Tabel Proses FMEA Untuk komponen-komponen Mesin Center, Toshiba BMC-100(5).

Proses FMEA Dari Komponen-Komponen Mesin Center, Toshiba BMC-100(5)										
Nama Komponen/ Proses	Jenis Kerusakan	Penyebab Kerusakan	Efek Terhadap Terhadap Sebuah Proses	Efek Terhadap Pelanggan	Pengendalian	Kejadian Jenis Kegagalan	Keburukan Terhadap Proses	Keburukan Terhadap Pelanggan	Deteksi Probabilitas	*RPN*
Cutter tumpul	Terjadi tekanan berlebih pada produk	*Cutting speed*	Produk penyok	Berkurangnya kepercayaan pelanggan terhadap kualitas produk	Perawatan 100%	9	10	10	2	1800
Tekanan angin dari Mesin Center, Toshiba BMC-100(5) menurun	Material terbentur dan bergesekan dengan benda lain	Kerja mesin berlebih	Produk penyok		Perawatan 100%	9	9	8	3	1944
Gerakan X axis bergetar pada saat *rapid*	Proses *cutting* tidak berjalan baik	Motor penggerak axis kotor	Produk tidak terrmakan sempurna (gompal)		Perawatan 100%	8	9	8	6	3456
Diameter *spindle* 1 dan 2 tidak sesuai	*Spindle* mati dan membentur produk	Penyetingan *spindle* tidak sempurna	*Spindle* mati dan membentur produk		Perawatan 100%	8	9	6	7	3024
Spindle mati dan membentur material	Spindle menabrak material	Komponen *spindle* rusak	Produk penyok		Perawatan 100%	7	8	5	5	1400
Gerakan Z axis sering bergetar	Proses *cutting* tidak sempurna	Motor penggerak axis kotor	Produk tidak terrmakan sempurna (gompal)		Perawatan 100%	8	9	8	5	2880
Ukuran *cutter* tidak sesuai	Proses *cutting* tidak sempurna	Kelalaian operator	Ukuran produk tidak sesuai		Perawatan 100%	7	8	7	7	2744

Tables (continued) 9. Process FMEA

Alternative Tindakan Pengendalian	Tanggapan
Lakukan pengecekan terhadap komponen mesin atau lakukan penggantian komponen jika di perlukan	Dari hasil perhitungan RPN dengan nilai 1800, untuk komponen *Cutter* tumpul berada pada prioritas pertama untuk dilakukan tindakan perbaikan.
Lakukan tindakan perawatan pada mesin agar kerja mesin optimal.	Dari hasil perhitungan RPN dengan nilai 1944, untuk tekanan angin dari Mesin Center, Toshiba BMC-100(5) menurun berada pada prioritas kedua untuk dilakukan tindakan perbaikan.
Lakukan seting & penyetelan	Dari hasil perhitungan RPN dengan nilai 3456, untuk proses Gerakan X axis bergetar pada saat *rapid* perlu dilakukan tindakan perawatan dan pembersihan untuk komponen X axis.
Lakukan tindakan perbaikan atau perawatan komponen pada mesin	Dari hasil perhitungan RPN dengan nilai 3024, untuk proses Diameter *spindle* 1 dan 2 tidak sesuai perlu dilakukan tindakan perawatan dan penyetingan terhadap komponen *spindle*.
Lakukan penanganan perbaikan atau perawatan komponen pada mesin	Dari hasil perhitungan RPN dengan nilai 1400, untuk proses *spindle* mati dan membentur material perlu dilakukan tindakan perawatan dan penggantian terhadap komponen *spindle*.
Lakukan seting & penyetelan	Dari hasil perhitungan RPN dengan nilai 2880, untuk proses gerakan Z axis sering bergetar perlu dilakukan tindakan perawatan dan pembersihan terhadap komponen Z axis.
Lakukan tindakan perbaikan atau perawatan komponen pada mesin	Dari hasil perhitungan RPN dengan nilai 2744, untuk ukuran *cutter* tidak sesuai perlu dilakukan tindakan pemasangan komponen *cutter* yang sesuai dengan kebutuhan produksi.

VI. CONCLUSION

Based on the process of research the final project has been carried out and the objectives that have been set up in the beginning, then the obtained conclusions from research that has been done is as follows:

1. Based on the results of the pareto diagram of types of disabilities the most dominant of four of these products is undercuted, with a disability percentage of 36.36% for products of ANGEL FWD SUPPORT while the dominant defects for the product presentasenya FITTING FORK is flawed 30.30% of all that is happening.
2. Based on the results of the analysis of the fishbone diagram of the 5 factors (human, machine, product, environment and method), the factors that lead to the product being defective undercuted, damaged, undersized and is a factor in the engine, because the components of the engine Center, Toshiba BMC-100 (5) causing damage to the product being defective.
3. From the results of the assessment of the ugliness of the production process, that the components of the cutter dull and wind pressure on a machine Center, Toshiba BMC-100 (5) decreases the occurrence of major impact resulting damage or defects caused by components engine Center, Toshiba BMC-100 (5), so that the evil of the system may cause the machine functions and inhibit the working of the machine.
4. from the results of the penilian type of malice toward customers that blunt cutter components declining very high impact, when the level of ugliness when this type of potential damage that affect the safety function of the system.
6. From the results of the assessment of the frequency of causes of damage to the intensity of damage most often happens is on the components of the cutter dull and wind pressure on a Toshiba machine, Center BMC-100 (5) decreases to the value 9, i.e. the probability of damage is 4 times in 1 year = 0.333.
7. Based on the results of detection probability for penilian components of the cutter dull Very high/high, meaning the ability of the control tool to detect shape and potential failure causes very high/mechanism to detect the next failure mode, while for wind pressure on the engine Center, Toshiba BMC-100 (5) decreases the High/high, meaning the ability of the control tool to detect shape and causes failure of high potential. So there is no warning or detection tools that can prevent such vices will occur on both the component.
8. From the results of calculation of RPN (Risk Priority Number) obtained as a result of that action for care or handlers which must shortly be done (pioritaskan) is a component of the cutter dull with the value of the RPN i.e. 180 and wind pressure on a machine Center, Toshiba BMC-100 (5) with the value of the RPN i.e. 243.
9. Based on the table of the FMEA process was created on tables 8 and 9 it can be seen that the components which occupy the priority to do acts of care is a component of the cutter and wind pressure on a machine Center, Toshiba BMC-100 (5) decreases, in addition can also be seen the influence of damage from each component of the engine Center, Toshiba BMC-100 (5), so it can be immediately taken corrective action by maintenance at PT. Dirgantara Indonesia.

Based on the results of the analysis it can be concluded that the most influential component and cause disability (rejects) on the product generated by the engine Center, Toshiba BMC-100 (5) is a component of the cutter dull currently first and second wind pressure is currently on a machine Center, Toshiba BMC-100 (5) decreases. Therefore it needs to be done soon care action against both the component so that it is not the case of malice in the production process.

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