Analysis of Quality Management System in the Textile Industry with the 5R/ 5S Method and Fish Bone Diagram

[1]*Rahmi Rismayani Deri, [2]Iwan Satriyo Nugroho, [3]Darwin Nahwan
[4]Rafika Ratik S, [5]Taufik Malik J

[1,2,4,5] *Industrial Engineering/ Engineering faculty, University of Islam Nusantara,, Bandung*
[3]*Management/ Economy faculty, University of Islam Nusantara,, Bandung*
**rahmirismayani20@gmail.com*

Abstract. *The textile industry is developing rapidly which results in intense competition for similar companies. CV JL is a textile manufacturing company that produces gray fabrics that have 3 quality levels, namely Grade A, B and C with Grade A being the best quality with the least amount of defects. CV.JL has experienced a decrease in the quality of production due to a decrease in the quality of production at its work stations which has resulted in decreased demand and company profits. Based on the statistical assessment and weighting of 5 workstations, Warping workstations have the lowest performance level with the highest contributor to product defects. With an assessment based on the 5R / 5S concept and the Fish Bone Diagram, analyzing the root causes of the problem, various corrections were generated which were written in the Manual, Standard Operating Procedure (SOP) and Work Instructions.*

Keywords: Quality , 5R/ 5S , Fish Bone, and SOP

1. INTRODUCTION

The background CV. JL is a company engaged in the manufacturing of Greidge Fabrics, which is located at Jalan Laswi no, 5 Desa Biru, Kecamatan. Majalaya, Bandung Regency. This company has a production system based on the job-order method which is received not directly from consumers but from the center, namely from CV. JL all problems regarding production results, incentive management and others are accountable to the center, namely the CV. JL Products produced by CV. JL based on the result of the production process is Greidge Fabric with 8 Pattern Orders. The initial raw materials used are Warp Yarn and Feed Yarn.

Production results will produce a cloth with a grade that has been divided into 3 parts, there are points that make the grade worthy of being called A / B / C. The production standard expected by the company is grade A cloth. The following is a brief overview of the grade of the fabric produced from the production process: 1.Grade A, The cloth that has grade a has 1 to 4 level of defect points, so in one roll of cloth that is inspected or controlled, t should not be more than 4 points to the defect level; 2.Grade B, Grede B is a grade where the number of defect points that must be achieved is 5 to 8 points in one cloth roll that is inspected or controlled; 3.Grade C, Grade C is a grade where the number of defect points for the fabric is 9 to 10 defect points in one fabric roll.

Within the fabric grade, there are fabric defect points, which are called fabric defects, which are abnormalities that appear on the fabric surface as a result of production errors. And the types of defects in fabrics in CV. Jaya Lestari is:

a.PB: Break the thread / break the warp / feed brancha thread break is usually the fabric that has a cavity that is not filled because the thread is broken.
b.BT: Embossed Yarn, Embossed thread is an embossed thread on the surface of the fabric.
c.KP: Broken fabric / branched thread, Broken cloth is a cloth with spots but is bigger and there is also a hole but a bit small.
d.KO: Dirty Cloth, Dirty cloth is a cloth that is dirty from needle oil or engine oil.

e.PJ: Disconnect the needle, The broken needle is like a dot but aligned because there is a problem with the needle so that every rotation of the needle there is a defect like a dot.

f.KB: Speckled / Stringed Cloth / Feed Spot, Spot cloth is a cloth that has small needle marks but the spots are randomly positioned on one roll of cloth.

g. Needle is broken, The broken needle usually has a hole but is not in the same direction or random because there is a broken needle in the machine.

h. Thread / weft threads, The striped thread is an empty part of the thread in the fabric that is usually a straight line across the fabric.

i. Line, The groove is because there is a damaged needle position that is used in the knitting machine which results in groove. Usually channel issues parallel from the top to the bottom of the position.

The quality of the fabrics in the Greidge warehouse has 3 categories, namely:

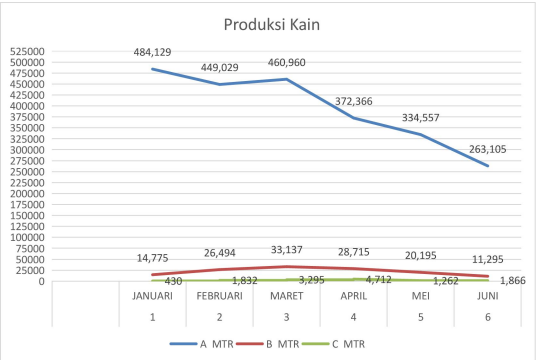
a. Grade A is the best Grade fabric Production., Grade B is Greige Fabric with quality below Grade A and Grade C is the lowest quality Greige fabric.

Figure 1. Types of damage to greige fabric products

Table 1. Quantitiy Products that produced by CV. JL Bandung Regency period January - June 2019:

NO	BULAN	A MTR	B MTR	C MTR
1	JANUARI	484,129	14,775	430
2	FEBRUARI	449,029	26,494	1,832
3	MARET	460,960	33,137	3,295
4	APRIL	372,366	28,715	4,712
5	MEI	334,557	20,195	1,262
6	JUNI	263,105	11,295	1,866
Totals		2,364,146	134,611	13,397
Average		394,024	22,435	2,233

Figure 2. Graphic Quantitiy Products by Grade :



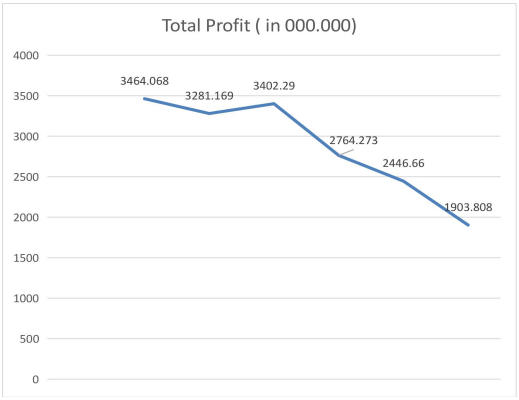


Fig 3. Total Profit of Greige Fabric Production according to Grade Period January to June 2019 CV Jaya Lestari, Bandung Regency

2. LITERATURE REVIEW

2.1 Production System

A process in a production system can be defined as a sequential integration of labor, material information, work methods and machines or equipment in an environment in order to produce added value for products so that they can be sold at competitive prices in the market.

This process converts structural inputs into measurable outputs through a number of organized sequential steps. Another definition of a process is a collection of tasks linked through a flow of material and information that transforms various inputs into useful or high-value added outputs, a process has the capacity or ability to store material (which is converted into semi-finished goods) and information. During the transformation, for example, the textile manufacturing process uses raw materials in the form of warp and weft. This material, together with the labor capital equipment, energy work energy, managerial information and others, is transformed into greidge cloth. It should be noted that the process of each production system has different specifications for example the textile production process is different from the cement production process however in general there are three categories for all activities in the process of the three categories are: tasks, flows and storage.

A task or activity is said to have added value if the addition of several inputs to that task will provide added value to the product (goods and / or services) as desired by consumers. Some examples of tasks that have added value (1) operating the Weaving Machine equipment to change one sheet of greidge fabric without defects or minimum defects, (2) testing the material to ensure that the material conforms to the set standards. 2.5. Quality Management System

The purpose of the quality management system is to convince consumers that the products the company produces are able to meet the requirements of the buyers. According to the International Organization for Standardization, a quality management system is a way for a company to control related activities (either directly or indirectly) to achieve the desired results. Hadiwiardjo and Wibisono (1996: 18) state, companies that run a quality management system tend to show the following characteristics:1. There is a philosophy that prevention is better than detection, correction, and results; 2. Consistent communication across processes and between production, suppliers and buyers; 3. Careful maintenance of documents and their critical control efficiently; 4. Quality awareness of all employees; very high management trust.

2.2. Concept 5S / 5 R

The 5S / 5R concept is implemented by world-class companies to improve performance continuously fundamentally through improved principles to maintain high performance, orderly, clean and safe workplaces. 5S / 5R allows everyone to separate normal AP conditions and abnormal AP which is the basis for continuous performance improvement and is and is a systematic approach to improving the performance environment, processes and products by involving all employees in the production or office environment. The SS / 5R concept is part of the Continuous Improvement Model: a.Seiri / Brief, b.Seiton / Neat, c.Seiso / Resik, d.Seiketsu / Take care, e.Shitsuke / Diligent.

The 5S / 5R concept must eliminate 8 Wastes of 5S: 1.Overproduction, 2.Overprocessing, 3.Waiting, 4.Motion, 5.Transportation, 6.Inventory, 7.Defects and 8.Wasted Potential. The control or instrument, whether according to production according to 5S / 5R standards, consists of 4 control groups to control 5 aspects of the 5R / 5S:

1.Manpower

a.Do they follow standards? (SOP etc.), b.Is work efficiency acceptable? c.Are they aware of the problem (Problem Conscious)? d. Do they have responsibilities? e. Do they have any qualifications? f. Do they have experience? g.Are they assigned to the right job h.Do they want to make improvements?i. Can they work together as a team? j.Are they healthy and vibrant?

2.Methods

a.Are work standards available? b. Are the standards continuously improved? c.Is there a safe method? d.Is there a method that guarantees good quality e. Was the method used effective and efficient? f.Are there work steps (work instructions)? g.Are there sufficient standards for machine / equipment setup? h.Is there a method of controlling temperature and humidity? i.Is ventilation and lighting good? j.Is there any communication on the process?

3.Materials

a.Is there an error in the volume? b.Is there an error in the quality standard? c.Is there an error in the specifications in the agreed standards? d. Is the inventory level sufficient? e. Is there a waste of material? f.Is the material handling good? g.Is there a lot of Work In Process Material? h.Is there a material storage layout i.Is there any records of material usage per unit time (hours, shifts, etc.)? j. Are there other problems with the material (please specify if any).

4.Machine

a.Does the machine / equipment meet the needs of the Production standard? Does the machine / equipment meet process capacity? b.Is there sufficient cleaning / lubrication of the equipment. c.Are there sufficient inspections of machines or equipment? d. Are there any damaged machines / equipment that stop production?e. Does the machine / equipment meet the precision requirements? f.Is there any unusual noise on the machine / equipment? g.Is there a machine placement layout? h.Does the machine / equipment have a good maintenance record? i.Does the machine / equipment have a good TPM performance? (Ulul Azmi, 2020). The 5S / 5R concept is planned and implemented to ensure every production activity at the work station as well as being a tool for detecting problems at the work station. While the method for detection uses the Root Cause Analysis tool.

2.3. FishBone / Fishbone Diagram

Cause Effect Diagram was developed by Kaoru Ishikawa, Ph.D in 1943 and is often called the Ishikawa Diagram. Tools in analyzing quality with the aim of thoroughly knowing the relationship between failure and its cause by finding the factors that are the cause of a problem. The fish head is the result of the Effect and a thick arrow in the diagram goes to Effect.

The 5 main factors in a Fishbone diagram include:a. Human b. Methods of work c. the environment d.Machines / tools e.Material / material. In Coalitioning the Problem there are several steps: a.Step 1. Agree on the Problem Statement. For example: “Potential Hazards for Textile Industry”.

Category 6 M in Fishbone Theory: 1.Machine (technology), 2.Method (process), 3.Material (including raw material, consumption, and information), 4.Man Power (labor or physical work) / Mind Power (mind work: kaizen, advice, and so on), 5.Measurement (measurement or inspection), and 6.Milieu / Mother Nature (environment);

a. Step 2. Identify the Categories. From the main horizontal line, draw a diagonal line that becomes the "branch" of each branch representing the "main cause" of the problem being written down. c. Step 3. Find Potential Causes by Brainstorming. Each category has causes that need to be elaborated through a brainstorming session. Decide under which category the idea should be placed, eg “Why is the potential danger? Cause: Employees don't follow procedures! " Because the cause is employees (humans), it is placed under "Man".

Causes are written in horizontal lines so that many small "bones" come out of the diagonal line. Ask again "Why did the cause appear?" so that the "bone" is smaller (sub-cause) out of the horizontal line, for example: "Why are employees said not to follow the procedure? Answer: because they do not wear PPE ". One cause can be written in several places if it relates to several categories.

Another example of a Fishbone Diagram

Case Study: Root Cause Analysis: a.Identification of the incident to be investigated b.Determine the Investigator Team c.Collect data & information (Observation, Documentation, Interview) d. Chronology of events (Narrative Chronology, Timeline, Time Person Grid.) e. Identification of CMP (Care Management Problem) (Brainstorming, Brainwriting) f. Information Analysis (5 Why's, Change Analysis, FishBone) g.Recommendations and Work Plan for Improvement.

2.4. Description of the Production Process

1. Raw material of yarn. The raw material used is in the form of yarn in the form of cones (soft cones), the thread is divided into 2 types which are used for warp and weft.

2.Warping. The types of threads used for warp start to be installed and drawn in the warving, which is the process of drawing with the number of strands and the length of the warp threads according to the order.

3.Beaming. After finishing the warping, the next process is to draw the beaming, which is dividing the length of the warping thread from the warping beam to the beam beaming party, to produce warp beams that are ready to be installed in weaving.

4.Leasing. The leasing process is only intended to tidy up one by one the warp threads in the beam in order to facilitate the drawing process.

5.Drawing.The warp beam that has been leased is ready to work on the drawing, namely the process where the warp threads have been inserted sequentially into the gun and comb, so they are ready to go up to the weaving process.

6.Weaving. The weaving process is the manufacture of woven fabrics or weaving between warp

and weft threads (launching weft threads, pattern pressing, warp and weft weaving, winding woven fabrics).
7.Inspecting. The purpose of this process is to see the quality of the weaving process by counting the number of defects for each piece of woven fabric. Fabric defects can occur in the weaving process and the distribution of fabric quality according to the grading point
8. Greidge cloth warehouse. Fabrics that have been inspected are directly stored in the Greidge warehouse, stored according to their respective patterns and quality and ready to be shipped.

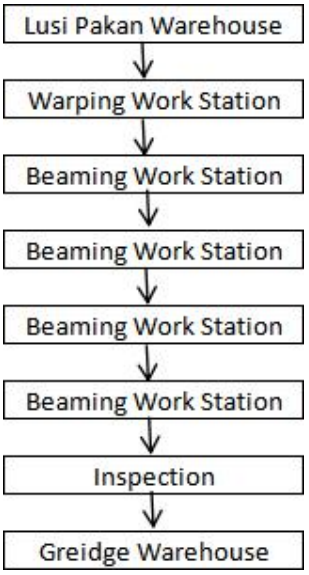


Figure 4. Work Station flow Greidge fabric production/ manufacturing

Aspects that are considered are:
1. Impact on quality. This consideration has the highest weight, namely 5, assuming that the focus on improvement is to improve quality. In the 4M aspect, the higher the impact on quality if the improvements are made, the higher the value
2. Production Critical Points. This consideration has a weight of 4, assuming that the second focus on improvement is the tipping point that becomes a barrier to quality improvement. In the 4M aspect, the higher the urgency or urgency for improvement, the higher the value
3. Difficulty level increase. This consideration has a weight of 3, assuming that the Third focus on improvement is how difficult it is for us to make the improvements or how likely we are to make the improvements. In the 4M aspect, the higher the difficulty level the lower the score. We focus on the easiest things to solve first
4. The time needed if the repair is done. This consideration has a weight of 2, assuming that the Fourth focus on the improvement is how long it will take us to make the improvements. In the 4M aspect, the longer it takes, the lower the value. We focus on the things that are quickest to finish first. The weighting above is needed to make a priority scale in making improvements .

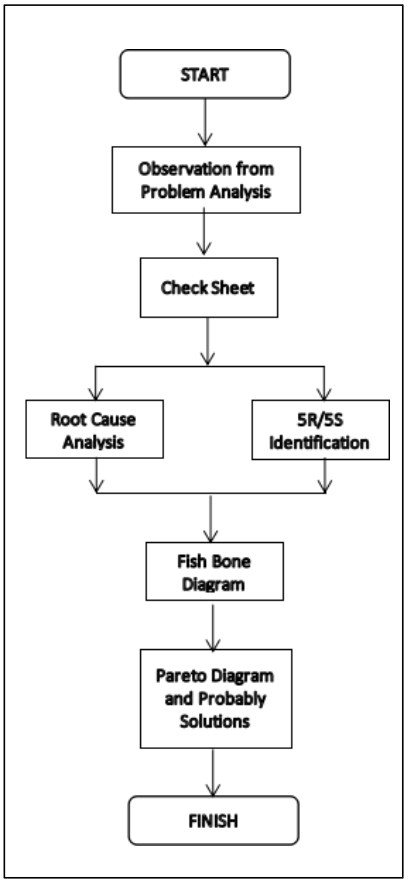
3. METHODS

3.1 Thinking Framework

The problem-solving model used in this study is described in Figure 3.1. This frame of mind is a framework for solving company problems in each operational work station, the existing problems are standardized with 5R / 5S in order to achieve the maximum standard production achieved by the company in the company distribution that is measured qualitatively. The current condition is compared to the condition of company performance in accordance with the 5R / 5S concept standard. From the gaps obtained, an analysis of the CV management system was conducted. Jaya Lestari in relation to the concept of a 5R / 5S performance culture, along with the identification of deficiencies and things that need to be repaired or completed

3.2 Research Methods

This research is descriptive research with qualitative descriptive analysis. In this study, the entities will be analyzed from the application of the 5R / 5S concept in its effect on improving the quality of production and products in CV. Jaya Lestari.



This research is a qualitative research, namely: recording procedures to describe or describe the state of the object under study based on existing facts. Qualitative research describes and interprets data regarding the situation, attitudes and views in society (Ahira, 2011). The objectives to be achieved from users of descriptive analysis techniques, namely a study by describing systematically, factually, and accurately from facts, events in CV. Jaya Lestari

This type of research is a descriptive study using a survey. Descriptive research can be defined as a process of problem solving which is investigated by describing the current state of the subject and research object based on existing facts or what it looks like. The implementation of descriptive research methods is not limited to collecting and compiling data, but includes analysis and interpretation of the data, besides that all the data collected may be the key to what is being studied.

This study uses the Root Cause Analysis method with Fishbone Diagram which is a tool method in analyzing quality with the aim of thoroughly knowing the relationship between failure and its causes by finding the factors that are the cause of a problem.The fish head is the result of the Effect and a thick arrow in the diagram goes to effect.

3.3 Research Procedures

To make this research easier, a research process / steps is made. The process / steps carried out in this study consisted of: problem identification, research objectives, literature review, data collection, data processing, data processing analysis and quality documentation system design proposals, application of quality systems and analysis of the results, until finally conclusions and suggestion. Figure 6 describes the process flow diagram of the steps carried out in this study.

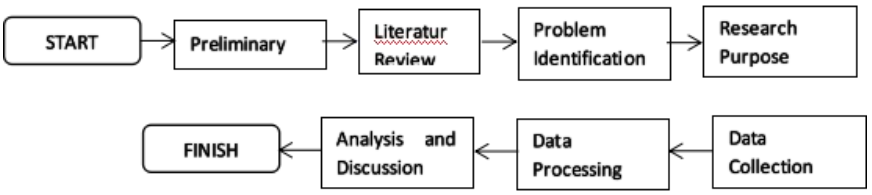


Figure 6. Process flow of Research Method

4. RESULT AND DISCUSSION

Table 1 Weighting of 4 M Aspects in 3 Main Working Station

No		Dampak thd Kualitas	Titik kritis Produksi	Tingkat kesulitan thd produksi	TIME	COST	TOT
		5	4	3	2	1	
BEAMING	MANPOWER	8	8	8	8	7	119
	MACHINE	7	7	5	3	4	88
	METHOD	7	7	7	4	2	100
	MATERIAL	7	7	7	4	2	100
WARPING	MANPOWER	8	8	7	8	7	116
	MACHINE	6	6	5	3	4	79
	METHOD	6	6	7	4	2	85
	MATERIAL	6	6	4	4	2	76
WEAVING	MANPOWER	5	5	8	8	8	93
	MACHINE	9	9	5	7	5	115
	METHOD	7	6	7	7	8	102
	MATERIAL	4	4	3	4	4	57

The aspects are as follows:

1. Impact on quality

This consideration has the highest weight, namely, assuming that the emphasis on improvement is to improve quality. In the 4m aspect, the higher the impact on the quality if the improvements are made, the higher the value is

2. Critical Production Points

This consideration has a weight of 4, assuming that the second concentration on the improvement is the tipping point that becomes a barrier to improve quality. In the 4M aspect, the higher the urgency or improvement, the higher the value

3. Increased level of difficulty

This consideration has a weight of 3, assuming that the third development on the improvement is to know how difficult it is to improve or the likelihood of making improvements. In the 4m aspect, the higher the level of difficulty, the lower the score. We focus on the easiest things to solve first

4. The time required if the repair is complete

This consideration has a weight of 2, assuming that the fourth development on the improvement is duration of the duration to make the improvements. In the 4m aspect, the more the value is low. We focus on the fastest things to finish first. The weighting above is needed to make a priority scale in making improvements. From the data above, it is clear that the focus for improvements is to:

1. At the Warping Work Station, the focus for improvement is the Human Aspect (Manpower) and the Work Method (Method); 2. At the Beaming Work Station, the focus for improvement is the Human Aspect (Manpower), Work Methods (Method) and Materials; 3. At the Weaving Work Station, what is focused on improvements is the Machine Aspect (Machine), and the Work Method (Method).

Table 2. 5R/ 5S Checklist for Analysis

No	5R/5S Checklist	Results		
		Yes	in part	No
MANPOWER				
1	Do company personnel follow SOP Standards?		√	
2	Is Efficiency acceptable?	√		
3	Are they aware of the problem?			√
4	Do they have responsibilities?	√		
5	Do they have the qualifications?		√	
6	Do they have experience?	√		
7	Are they assigned to the right job?	√		
8	Do they want to make improvements?		√	
9	Can they work together as a team?	√		
10	Are they working with health and enthusiasm?	√		
METHODS				
1	Are there working standards?		√	
2	Are these standards being improved continuously?			√
3	Is there a safe method?			√
4	Is there a method that guarantees quality?		√	
5	Are there any methods that guarantee effectiveness and efficiency?		√	
6	Are there any work steps?		√	
7	Are there sufficient standards for machine setup?			√
8	Is there a method of controlling temperature and humidity?			√
9	Is there good ventilation and lighting?	√		
10	Is there any communication about the process?	√		

From the result of audit interviews and in-depth field audits above, it has been found that:

1. For the Power Man aspect, the following data are obtained:
   Of the 10 aspects carried out in the field audit, data were obtained:
   Total Audit Articles = 10, Points Yes Filland = 6 (60%), Partial Embodiments = 4 (40%)
   Points No = 0 (0%)
2. For the method look, the data is obtained:
   Of the 10 aspects carried out in the field audit, data were obtained:
   Total audit articles = 10, Points Yes Filland = 2 (20%), Partial Embodiments = 4 (40%)
   Points # = 4 (40%)
3. For the hardware aspect, the following data are obtained:
   Of the 10 aspects carried out in the field audit, data were obtained:
   Total audit elements = 10, yes completed points = 6 (60%)
   Fresh Part Points = 1 (10%), points No = 3 (30%)
4. For the machine aspect, the following data are obtained:
   8 aspects carried out in the field audit, data were obtained:
   Total audit elements = 8, Points yes completed = 3 (30%)

Partial Embodiments = 4 (40%), points No = 1 (10%) Sahaan)

Based on the research framework process, the following is the calculation and analysis for the Warping workstation

Table 3. Check Sheet Warping Work Station and Analysis

Realisasi Order Warping

OK : 1228 — WARPING 2

OC : KR 7260 C

Jenis Benan : DTY 75/72 SDC SH INT LOT

Jumlah Hela : 3612

speed :

Tgl	Waktu seting			Waktu proses			OK	OC	No Urut	No beam	Brutto	Tarra	Netto	Meter
	start	stop	menit	start	stop	menit								
				02.00/04.00	03.00/06.00	180	1228	KR	1	F			274,02	55.130
				07.00	10.00	180		7260	2	C			274,02	55.130
				10.20/13.00	12.00/14.00	160		C	3	W			274,02	55.130
				14.10	17.10	180			4	H			274,02	55.130
				17.20/19.00	18.00/21.20	180			5	G			274,02	55.130
				21.30	00.30	180			6	E			274,02	55.130
				00.50/04.00	03.00/04.50	180			1	M			273,48	55.020
				05.20	08.20	180			2	V			273,48	55.020
				19.20	22.20	180			3	J			273,48	55.020
				22.40	01.40	180			4	O			273,48	55.020
				02.00/04.00	03.00/06.00	180			5	K			273,48	55.020
				06.20	10.20	180			6	B			273,48	55.020
			-			2.140							3.285,00	660.900

			Terima Benang												
					Ex ok 1219		316 Dus				10.411,50	kg			
					Total						10.411,50	kg			
			Proses Warping												
			OK	1228				:			3.285,00	kg			
			Benang sisa Utuh			216	Dus	:			7.100,50	kg → Dipakai untuk ok selanjutnya			
			Benang sisa Warping			11	Dus	:			25,20	kg			
			Aval					:			0,50	kg			
								:			10.411,20	kg			
			Susut					:			0,30	kg			

Table 4. Results of 5R/ 5S Checklist and Check Sheet on Field Identification at Warping Work Station and Analysis

No	Damage Condition	Aspecs							
		People		Material		Method		Machine	
		Cause	Effect	Cause	Effect	Cause	Effect	Cause	Effect
1	If the connection is too long	The thread installation is not correct / the position is not good	Break up or twist	If Hadrotol is bad / interlist is bad / broken	Break up or twist	Wrong / careless operator work process	Breaks or kinks or hairs		
2	The thread broke away	Lack of accuracy	The disconnect is far / away			Wrong / careless operator work process	Breaks or kinks or hairs		
3	Fluffy Yarn							Bearing Pesrol is broken	All fluffy threads, many broken
4	The yarn are crossed during bleaching	Lack of accuracy, use when using it less thoroughly	Crossed threads						
5	Loose rolls							Valve leak	Loose thread
6	Loose rolls	Lack of accuracy						Tension Ring is broken	The result of the fabric pull is

Based on the research framework process, the following is the calculation and analysis for the Beaming workstation

Table 5 Check Sheet Beaming Work Station and Analysis

REALISASI BEAMING

BEAMING 1

TGL TERIMA BENANG : DARI WARPING
ORDER KERJA : 1227
OC : KR 7652 A
JENIS BENANG : DTY 75/36 SDC SH INT 4Y153175
TERIMA DARI WARP : 3.779,22 Kg
SISA BENANG WARPING : Kg
SISA BENANG UTUH : Kg

Waktu setting				waktu proses			OK	OC	No	No	Panjang	Netto	Te	Naik		Kett
Bulan	start	stop	menit	start	stop	menit			Urut	Beam	Mtr	Kg	HL	Tgl	Mc	
Januari				10.30/13.00	12.00/15.00	210	1227	KR	1	T 1519	8.000	273,43	3.964			
				15.30/19.00	18.00/19.30	180		7652	2	T 1520	8.000	273,43	3.964			
				20.00	23.10	190		A	3	T 23 N	8.000	273,43	3.964			
				23.40/03.00	02.00/03.50	190			4	T 125	8.000	273,43	3.964			
				04.20	07.40	200			5	Y 3066	8.000	273,43	3.964			
				08.00	11.10	190			6	T 1546	8.000	273,43	3.964			
				11.30/13.00	12.00/16.00	210			7	T 1511	6.980	238,57	3.964			
03/01				11.00/13.00	12.00/16.30	270			8	C 69	8.000	273,43	3.964			
				17.00/19.00	18.00/21.40	220			9	T 1537	8.000	273,43	3.964			
				22.00	01.00	180			10	T 1547	8.000	273,43	3.964			
				01.20/04.00	03.00/05.20	180			11	T 1535	8.000	273,43	3.964			
				05.40	08.50	190			12	T 2312	8.000	273,43	3.964			
				09.00/12.30	11.30/13.00	180			13	T 2305	8.000	273,43	3.964			
				13.20	17.00	220			14	C 40	7.150	244,37	3.964			
			-			2.810					110.130	3.764,10				

Penerimaan Benang : 3.779,22
Pemakaian (PROSES) :
OK 1227 : 3.764,10 kg

waste : 14,28 kg
: 3.778,38 kg
Susut : 0,84 kg

Kett : No Beam T 1519 meter ke 5.440 ada lolos lusi 14 helai

Table 6. Results of 5R/ 5S Checklist and Check Sheet on field identificationat Beaming Work Station and Analysis

No	Damage Condition	Aspecs							
		People		Material		Method		Machine	
		Cause	Effect	Cause	Effect	Cause	Effect	Cause	Effect
1	If the connection is too long	The thread installation is not correct /	Break up or twist	If Hadrotol is bad / interlist is bad /	Break up or twist	Wrong / careless operator work	Breaks or kinks or hairs		
2	The thread broke away	Lack of accuracy	The disconnect is far / away			Wrong / careless operator work	Breaks or kinks or hairs		
3	Fluffy Yarn							Bearing Pesrol is broken	All fluffy threads, many broken
4	The yarn are crossed	Lack of accuracy,	Crossed						
5	Loose rolls							Valve leak	Loose thread spools
6	Loose rolls	Lack of accuracy						Tension Ring is broken	The result of the fabric pull is abnormal

Based on the research framework process, the following is the calculation and analysis for the Weaving workstation

Table 7 Check Sheet Weaving Work Station and Analysis

	A	A Noon		B Night		C Morning		Total		A	A Noon		B Night		C Morning		Total
MC	OC	EFF	Prod Obstacle	EFF	Prod Obstacle	EFF	Prod Obstacle		MC	OC	EFF	Prod Obstacle	EFF	Prod Obstacle	EFF	Prod Obstacle	
A01		0%	Ks	0%	Ks	0%	Ks	-	A01		79%	0	0%	0	0%	0	-
A02	MK 3596 BN	96%	0	93%	0	96%	0	258	A02	MK 3596 BN	0%	0	0%	10585	0%	0	-
A03		0%	Ks	0%	Ks	0%	Ks	-	A03		0%	0	0%	0	0%	0	-
A04	MK 3596 BN	0%	stop kain belang	0%	stop kain belang	0%	stop kain belang	-	A04	MK 3596 BN	81%	10,5	0%	0	0%	0	-
A05	MT 9670	0%	stop false stop tggl	80%	Pb over tension	0%	stop false stop tggl	68	A05	MT 9670	76%	68	0%	0	0%	0	-
A06	MK 3596 BN	75%	0	39%	false stop	90%	0	168	A06	MK 3596 BN	59%	0	0%	0	0%	0	-
A07	MT 9670	0%	stop rod end cut trouble	61%	Pb relgun lepas	61%	stop rod end cut trouble	106	A07	MT 9670	97%	0	0%	0	0%	0	-
A08	MT 9670	0%	stop spindle belt ptus	59%	Pb cutter trouble	41%	stop spindle belt ptus	87	A08	MT 9670	73%	0	0%	0	0%	0	-
A09	MT 9670	79%	0	58%	pkan tk smpai	71%	0	176	A09	MT 9670	52%	10,625	0%	0	0%	0	-
A10	MT 9674 TN	0%	stop lusi trouble	0%	stop lusi trouble	0%	stop lusi trouble	-	A10	MT 9674 TN	0%	53,125	0%	0	0%	0	-
A11	MT 9674 TN	59%	pkan tk smpai	43%	Pb ring temple	63%	pkan tk smpai	134	A11	MT 9674 TN	97%	10,5	0%	0	0%	0	-
A12	MT 9674TNP	0%	stop false stop tggl	0%	stop false stop tggl	0%	stop false stop tggl	-	A12	MT 9674TNP	56%	57,5	0%	0	0%	0	-
A13	MT 9670	81%	0	37%	Pb ring temple	79%	0	168	A13	MT 9670	78%	0	0%	0	0%	0	-
A14	MT 9670	41%	roll kain tdk mtr	0%	stop ring temple trb	52%	Pb ring temple	75	A14	MT 9670	73%	9,875	0%	0	0%	0	-
A15	MT 9674TNP	0%	Bb set	0%	Bb set	0%	Bb set	-	A15	MT 9674TNP	59%	64,25	0%	0	0%	0	-
A16	MT 9674 TN	0%	stop lusi+elect trouble	0%	stop lusi+elect trouble	0%	stop lusi+elect trouble	-	A16	MT 9674 TN	74%	0	0%	0	0%	0	-
A17	MT 9670	71%	Pb lolos pkan	96%	0	96%	0	219	A17	MT 9670	80%	10,25	0%	0	0%	0	-
A18	MT 9670	82%	0	93%	0	75%	false stop	213	A18	MT 9670	85%	56,25	0%	0	0%	0	-
A19		0%	Ks	0%	Ks	0%	Ks	-	A19		64%	0	0%	0	0%	3816	-
A20	MT 9674 TN	97%	0	96%	0	75%	Pb gigi cor macet	210	A20	MT 9674 TN	56%	37	16700%	3816	0%	0	-
		76%	9	68%	11	73%	11	1.882			138%	9	1518%	11	0%	11	-

Table 8. Results of 5R/ 5S Checklist and Check Sheet on Field Identification at Weaving Work Station and analysis

No	Damage Condition	Aspecs							
		People		Material		Method		Machine	
		Cause	Effect	Cause	Effect	Cause	Effect	Cause	Effect
1	The engine cannot run smoothly							The engine cannot run smoothly	Deformed Fabric
2	Lusi Yarn break							Lusi Yarn break	spliced in serted
3	Trouble Leno Problem							The edge of the fabric is broken	The edge of the fabric is broken
4	Stop False							The cloth rotation of the engine stops	Deformed Fabric
5	Filter not sensitive								Deformed Fabric
6	Water Pressure							Water Pressure	Deformed Fabric/
7	Yarn of Pakan Lost								Deformed Fabric
8	Rough Comb							Rough Comb	Deformed Fabric
9	Dirty Nozzle							Dirty Nozzle	Deformed Fabric
10	Leno Broken							Leno Broken	Deformed Fabric

The next stage is description of "Fish Bone Diagram"

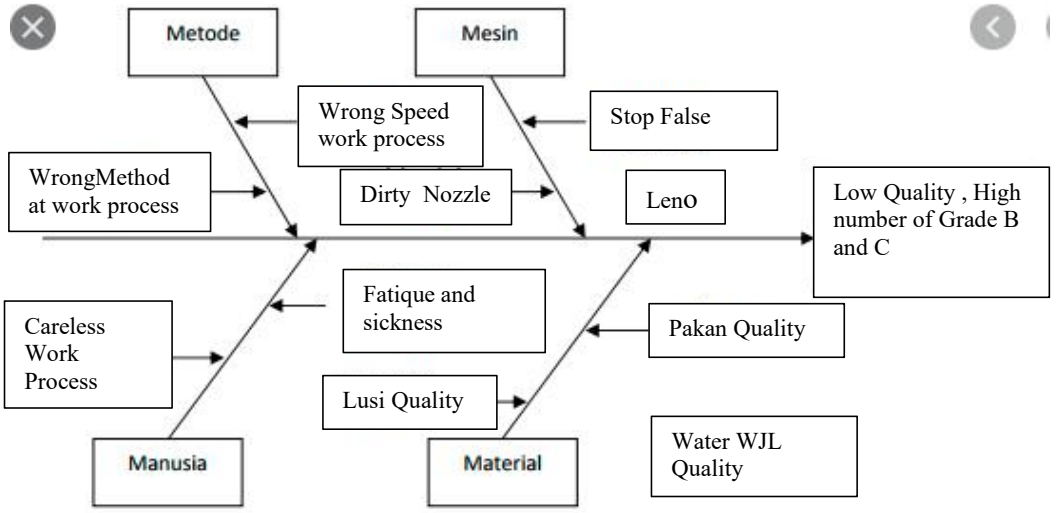


Figure 7. Fish Bone Diagram

CONCLUSION

From the results of the audit interviews and in-depth field audits above, it was found that:

1. For the Man Power aspect, the following data are obtained: From the 10 aspects that were carried out in the field audit, data were obtained: Total audit items = 10, Points YES Fulfilled = 6 (60%), Partial Fulfill Points = 4 (40%). Points NOT = 0 (0%)
2. For the Method aspect, the data are obtained: From the 10 aspects that were carried out in the field audit, data were obtained: Total audit items = 10, Points YES Fulfilled = 2 (20%), Partial Fulfill Points = 4 (40%). Points NO = 4 (40%)
3. For the Material aspect, the following data are obtained: From the 10 aspects that were carried out in the field audit, data were obtained: Total audit items = 10, Points YES Fulfilled = 6 (60%) Part Fulfill Points = 1 (10%), Points NO = 3 (30%)
4. For the Machine Aspect, the following data are obtained: From 8 aspects that were carried out

in the field audit, data were obtained:Total audit items = 8, Points YES Fulfilled = 3 (30%)

Partial Fulfill Points = 4 (40%), Points NO = 1 (10%) the detail points that are still lacking are as follows:

1. Manpower Aspects

a) Compliance in working according to standards., b. Awareness of the problem. c. Qualifications at work., d. Determination to make improvements. From this aspect, it is clear that there is a need to improve SOPs and renewal of SOPs, awareness, qualifications and spirit of continuous improvement.

2. Method Aspects

a. The existence of work standards that are continuously improved., b.The existence of a safe method.c. There are sufficient standards to set up the machine.d. There is a method of controlling temperature and humidity.From the aspect of work methods, what really needs to be improved is that the work standard must be modified and periodic (1 year or 2 years, the relevance of which is controlled). Security and safety at work. Written standard for machine set-up, so far it is clear that there have been a lot of machine setup activities but there are still no documents and it is officially documented. There is a special tool to control temperature and humidity levels

3.Material Aspects

a.There is an error in the volume, b.There is a standard specification error, c. There is a problem with the layout, d. There is a problem of material storage.From the material aspect, it is clear that there must be a method and standard for recalculating the volume, standard specifications for the procurement, storage, disposal, use and delivery of materials. efficiency of material use.

4.Machine Aspects

a. Machine aspects that have sufficient production standards. b. Machines are always checked for precision level. c. engineered aspects based on sound and suspicious aspects.

d. Lay out the machine. e. TPM Aspects From the aspect of the machine, it is clearly not standardized, there is no periodic precision check, an initial diagnosis control if there is a machine problem. Currently, there are only engine layouts in Weaping (WJL) but the others have not. The Total Productive Maintenance (TPM) aspect which requires all parties to take part in EMSIN maintenance has not been covered.

e. Step 5 - Propose and Implement Solutions

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