INDUSTRIAL PRACTICE REPORT

PT. DJARUM SKM GRIBIG

Sarah Yohana

15 14 08369

INDUSTRIAL ENGINEERING PROGRAM

FACULTY OF INDUSTRIAL TECHNOLOGY

UNIVERSITAS ATMA JAYA YOGYAKARTA

2018

APPROVAL

The industrial practice report which is written basen on the industrial practice at PT. Djarum SKM – Gribig during the period at December 18, 2017 until January 24, 2018 by:

Name	: Sarah Yohana
Student ID	: 15 14 08369
Study Program	: International Industrial Engineering
Faculty	: Faculty of Industrial Technology

has been approved.

Yogyakarta, May 14, 2018

On Site Mentor

Faculty Supervisor

Stephanus Martono, S.E.

Brilianta Budi N, S.T., M.T.

ACKNOWLEDGEMENT

TABLE OF CONTENT

Chapter 1. Introduction

Chapter 2. Company Background

Chapter 3. Company System

Chapter 4. Project Review

Chapter 5. Closing

References

List of Table

List of Figure

APPENDIX

Appendix 1. Observation Sheet in HLP 63 Machine (New Building)

Appendix 2. Observation Sheet of Appraisal Performance

Appendix 3. Daily Log of Working Activities

CHAPTER 1

INTRODUCTION

This chapter will focus on introduction which consists of background, objective, industrial practice location and schedule.

1.1. Background of Industrial Practice

Department of Industrial Engineering, Universitas Atma Jaya Yogyakarta (PSTI UAJY) defines the industrial practice as a simulator that enables the students not only to apply the Industrial Engineering knowledge into real-world industry but also to train the student how to be a professional of Industrial Engineer. For this purpose, during the industrial practice the students are requested to work in the host company for a period of one month.

The students should keep in their mind, that the paradigm of industrial practice is that the students are expected to experience the application of Industrial Engineering knowledge in practice in which it can be obtained if during their industrial practice the students do some activities to enhance their understanding in term of planning, designing, improving, implementing and problem solving. Therefore during the industrial practice periods the students are requested to:

a. Doing all the tasks that have been assigned by the host company

b. Following all of relevant working procedures of the host company

c. Capturing the big picture of the enterprise system in the host company and observing its characteristics

Since Industrial Engineer is dealing with the integrated system of some elements which are Man, Machine, Material, Methods, Money, Energy, Environment and Information, therefore during the industrial practice the students should relate all of their activities in term of system perspective. Based on the explanation above, it is clearly seen that industrial practice is not only gathering the data.

According to the Curriculum Document of PSTI UAJY, industrial practice is an academic course in which the students should register for the course for 2 credits. Then, in order to fulfill the academic requirement of industrial practice, the students

are required to submit an industrial practice report. The performance of the student itself is evaluated both by on-site supervisor and by faculty supervisor.

1.2. Objective of Industrial Practice

The aims of the industrial practice are:

a. Practice discipline

b. Improve the interaction between student and his/her ordinate or workmate

c. Practice adaptability in the working atmosphere

d. Observe the daily work in the host company

e. Enhance the Industrial Engineering knowledge in practice by seeing the practical work in the host company

f. Enhance the knowledge of enterprise system

1.3. Industrial Practice Location and Schedule

The industrial practice was held in PT. Djarum bagian SKM – Gribig, Kecamatan Besito, Kabupaten Kudus. The industrial practice duration started from December 18, 2017 until January 27, 2018. At the first week, student has opportunity to know about the company and started to discuss the project that should be done. Next, student observed and worked on the project. Analyzed the result then gave comment and suggestions. The idea is accepted but still not implement yet become suggestion for company. At the last, every works should be submitted and presented.

CHAPTER 2
COMPANY BACKGROUND

This chapter consists of Company History, Organization Structure, and Company Management.

2.1. Brief Company History

PT. Djarum is a cigarette company in Indonesia which is located in Kudus, Jawa Tengah. Djarum is establised in April 21, 1951. Oei Wie Gwan is the founder of this company. A grampahone needle is used as the symbol of this company. Djarum became incorporated in 1983 and changed its name to PT. Djarum.

This company started when Mr. Oei bought a small business that operated in clove, Djarum Gramophon, in 1951 its name became Djarum. Before, Djarum only produced for Dinas Perbekalan Angkatan Darat. Then in 1955, Mr. Oei started to sell clove in public and got good feedbacks. In 1963, this company was caught a fire and almost burned out the entire building and not long after the incident Mr. Oei passed away. This company was then taken over by Mr. Oei's sons i.e. Michael Bambang Hartono and Robert Rudi Hartono.

It was only the beginning. Djarum started to rise again and modernized equipments that support the production. In 1969, it started to export its products. After that Djarum started to introduce filter with its name is Djarum Filter which is used machine then Djarum Super started to be produced in 1981.

2.2. Organization Structure

Organization structure is a structural relationship between people who is connected to one another in doing each task and function in the organization. Organization structure is important, without organization structure company will be hard to operate. Organization structure in each company may be different because it adjusts with the needs of the company.

Figure 2.1. is the organization structure of PT. Djarum Gribig.
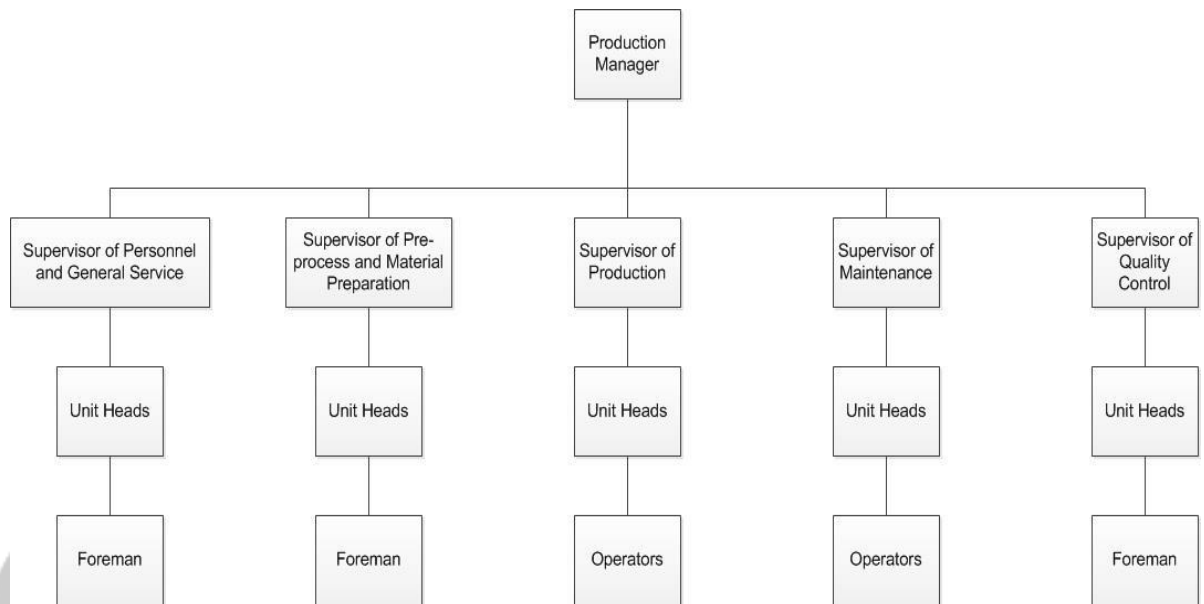
Figure 2.1. Organization Structure of PT. Djarum SKM Gribig

Task, authority and position of organization structure in PT. Djarum SKM Gribig will be explained below:

a. Production Manager

The tasks are:

i. Doing a policy which is related to production or demand.

ii. Make a planning in making products.

iii. Specify production strategy.

iv. Decide the amount and needs of materials needed for production.

b. Supervisor

The responsibilities are:

i. Responsible in supervise directly towards unit head under it (also surpervising every employees below it indirectly), it includes in giving training to its subordinates in order to reach limit level of the ability which is needed by its team and discipline its subordinates with the rules and regulation of the company.

ii. Responsible in reach level quantity of output, quality and production scheduling and machine utility level that already difined and agreed together.

iii. Responsible in fulfil the standart quality of finished product corresponding to customer's needs and delivery schedule of finished product according to PPIC schedule.

iv. Responsible in work safety and hygiene standard in working area (tidiness of work environment).

v. Responsible in doing coordination and build solid teamwork.

vi. Responsible in making report periodically for its superiors about their work and the problem analysis, actions, correction for every problem and limitation due date for the problems in brief.

Then the authorities of supervisor are:

i. Authority to discipline their subordinates according to the terms/regulations which apply in the company.

ii. Authority to stop and regulate the operation in each machine to reach the finished products that will fit the needs of customers and the production delivery time.

c. Personnel and General Service Staff

Personnel's activities are employees' master, absenteeism, and medication. While GS or General Service has duties to keep the toilet's cleanliness and the availability of drinks.

d. Quality Control Staff

Its task is to control every products produced by machine, checking 8 times every 1 shift, control for every process every 2 hours, and blocking defective products.

e. Supervisor of Maintenance and Staff

Maintenance here is doing preventive action every Monday until Friday and cleaning that already uses 5Rs system every Saturday.

f. Unit Head

Unit head has responsibilities to:

i. Planning every activities and cost.

ii. Implement every activities and cost.

g. Pre-Process Staff

Organize activities in production process for supporting material (foil, filter, CTP, sweetener, OPP cutsheet) according to the needs in production process which is based on work plan.

h. Foreman

Foreman has duties to cordinate their subordinates, control the flow of every activity, gives direction and guidance for every employees, decrease the reject from customer and defective products in processes, also define the causes for probems and formulate corrective action. Has responsibility towards Sub Production Department.

i. Operator

Operator has authority to inform their leader if there is any problem in products' quality. It also has responsible in reach the production's target, complete the productions report, implement production's activites according to parts item and amounts that already defined.

2.3. Company Management

2.3.1. Company's Vision and Mision

a. Company's Vision

Being the biggest in having sales value and profitability in cigarette industry in Indonesia.

b. Company's Mision

We are here to satisfy the smokers' need for smoking.

c. Description of the Vision

Leadership the market by producing high-quality products consistently and innovatively to satisfy consumers. Making good image which is strong enough for company and products. Dedicated professional managements and competent human resources.

d. Core Values

PT. Djarum has five core values in develop the company. The values are focus on the consumers, professionalism; continue to learn organization, one family, and social responsibility. Below is the explanation of each value:

i. Focus on Consumers

Consumers are very important part in the company's sustainability, without consumers, without any attractive consumers towards the products so the production will stop. PT. Djarum will always prioriteze the consumers for always get the

satisfaction towards the products, with giving prices which is relatively low although the profit they get is decreasing. Besides PT. Djarum always listen and fulfil the consumers' needs the best that they could.

ii.   Professionalism

Being profesional in develop the company best, started with the recruitment of good potential employees (one of the vitas element for the excitement of company's growth). Company's ability to do inovation continuously along with it, PT. Djarum always gives innovative's response towards the consumers. Profesional in implementing the strategies that already planned optimisticly. With profesionalism all of the above can be achieved.

iii.   Continue to Learn Organization

With the successes of awards and innovative products, PT. Djarum is not stop in that, with that kind of success, it always continues to learn. PT. Djarum also learns to score itself, and sharing knowledge with other companies. With this kind of attitude this should be balanced with openness and trust so that people will do changes and trials bravely without being threatened.

iv.   One Family

Sense of family can be felt in all layers in PT. Djarum, it can be seen in break time, sometimes the directors join the employees, share stories and having fun, this will creating fun feeling among the employees. This creates solidarity from every layer in management and employees. They together try to improve company, with the organization's solidarity, and hard working from all the employees.

v.   Social Responsibility

In social responsibility, for employees, PT. Djarum gives the very best attention to their employees with giving social assurance like health assurance, annual award, allowance, accident assurance, retiring assurance, PT. Djarum also gives scholarship for their emploees' children so that can continue the study well. Social responsibility is given not only for the employees but also for public. To do this kind of responsibility PT. Djarum doing Corporate Social Responsibility (CSR), for now things that already done are: Djarum gives 30 billions in building badminton court, GOR PT. Djarum Bakti Bangsa, which is used to recruit badminton players that have international skill standard. In environmental field, PT. Djarum gives free trees for greening.

2.3.2. Employment

All the employees in PT. Djarum are about more than 75.000 people, which are spread all over its departments in PT. Djarum. Things related to employment in PT Djarum Gribig Kudus are organized as follows:

a. Employees Recruitment

Procedures and requirements which are set for PT. Djarum recruitment are:

i.   Fill the form. It is meant to gather informations and complete datas from the candidates.

ii. Join the psychotest.

iii. Interview. In interview usually looks, ability to answer, education and what relates will be scored.

iv. Medical examination. It is done in order to prevent any possibility in getting employees which have illness that will interfered working process.

b. Working Hours

The regulations of employees' working hours in PT Djarum have been arranged according to the government's regulation. Below are the working hours in PT Djarum:

i.   Shift 1: 06.00 – 14.00 WIB

The break time is arranged by the employees themselves one hour duration.

ii. Shift 2: 14.00 – 22.00 WIB

The break time is arranged by the employees themselves one hour duration.

iii. Shift 3: 22.00 – 06.00 WIB

The break time is arranged by the employees themselves one hour duration.

For dinner, employees will be given a cathering and is suggested not to leave the factory for each employee's security. Working day in PT. Djarum Gribig is from Monday until Saturday. If there is a low demand usually there will held a mini-shift in Friday, so it will end at 16.00 WIB. In Sunday employees can be attend the work if there is a high demand. Working hours in Saturday and in Sunday are different from normal. For non-shift employees the working hours are as follows:

i.   Monday – Friday

The working hours start from 07.00 – 16.00 WIB with break time 11.30 – 13.00 WIB.

ii. Saturday

Start working at 07.00 – 12.00 WIB.

iii. Sunday

If there's high demand this day can be open for work with working hours start from 07.00 – 12.00 WIB.

c. Employees' Welfare

Company provides many facilities which are usefell for their employees' welfare. These facilities are provided in order to improve emploees' spirit. Here are the facilities that are provided by the company:

i. Holiday's bonus and others

ii. Mess for employees

iii. Canteen

iv. Mushola

v. Parking for cars and motorcycles

vi. Bus for picking up the employees

vii. Etc.

Employees' welfare not only given in form of material but also in form of attention towards employees' work safety. This becomes the main concern because work safety will influence the productivity and company's image. PT. Djarum already gave attention in employees' work safety; this can be seen through their safety work equipments given to the employees. The safety equipments are masker, earplug, gloves, safety shoes, safety helm, etc. But not all employees are given by those equipments, only employees with high risk of working condition that will be given. If there is a working accident so it will be seen first the causes and for the cost will be paid by the company.

PT. Djarum provides medicines and drink. For the Panelis there will be an injection once a month. Panelis are people that have responsibility to taste the cigarette's flavour from the R&D Department. The labors will be given a milk everyday to keep their health. There is also a company's docter for employees who are sick.

d. Facility

PT. Djarum provides some facilities that are:

i. Sport Centre

They are like badminton, volley, tennis, and basket court. There are also gym centre and jogging track.

ii.   Vehicles

For manager, senior manager, and director level provided with office car as long as in that position.

iii.   Scholarship

For employees in PT. Djarum, their family will have a scholarship for those who have good grades.

2.3.3. Marketing

PT. Djarum enlarges its marketing not just in indoneisa but also in other countres. It distributors has widely spread in west and middle of Indonesia. For products that have offered in other countries, PT. Djarum has distributed their product to Malaysa, Singapore, Arab, India, USA, and Europe. PT. Djarum also has company in Brasil and almost half of their employees are Indonesia that is assigned there. In order to improve service, PT. Djarum has plants in all of Indonesia which the bigest marketing office is in Java.

CHAPTER 3
COMPANY SYSTEM

This chapter is explained about company system which consists of business process, list of product, production process, and production facilities.

3.1. Business Process of the Company

A business process is a collection of linked tasks which will accomplish an organizational goal. Business process must be clear enough so that each person will know their task so that the company's goal will be achieved through this. Bellow in Figure 3.1. is the business process in the company.

Logistic & SCM	Administration	Production	Pre-Process	Maintenance	Quality Control	Primary
Receive order from central marketing						

Meeting the Capacity

	Schedule for 1 periode					
		Receive schedule	Receive schedule	Receive schedule	Receive schedule	Receive schedule
			Prepare material (CTP, Filter, Papir, etc)		Prepare inspection process	Prepare tobacco-ready-to-use
Receive the finish products		Doing production as scheduled				
		Evaluate the finish products				

Figure 3.1. Business Process of PT. Djarum SKM Gribig

3.2. List of Product

There are many variants of cigarette in PT. Djarum SKM Gribig. It produces cigarettes that will be sold in local and also for other country (export). The variants vary from the filter, cigarette paper, flavours and many more. Table 3.1. is the list of products produced in PT. Djarum SKM Gribig for local.

Table 3.1. List of Products

No.	Product Name	Product Picture
1	Djarum Super Mild	
2	Djarum Super 12	

Tabel 3.1. Continuation

3	LA Lights	
4	Djarum 76	

Table 3.1. Continuation

5	LA BOLD	

3.3. Production Process

The process of making a cigarette started with making its components, those are acetate tow, CTP, and tobacco. Others are gained from supplier. When all of the three components are done then they enter to a maker machine to be processed become a cigarette, process happened here is like rolling the cigarette. After finish it enters to the packer machine. The operation process can be seen as a chart shown if Figure 3. 2. below.
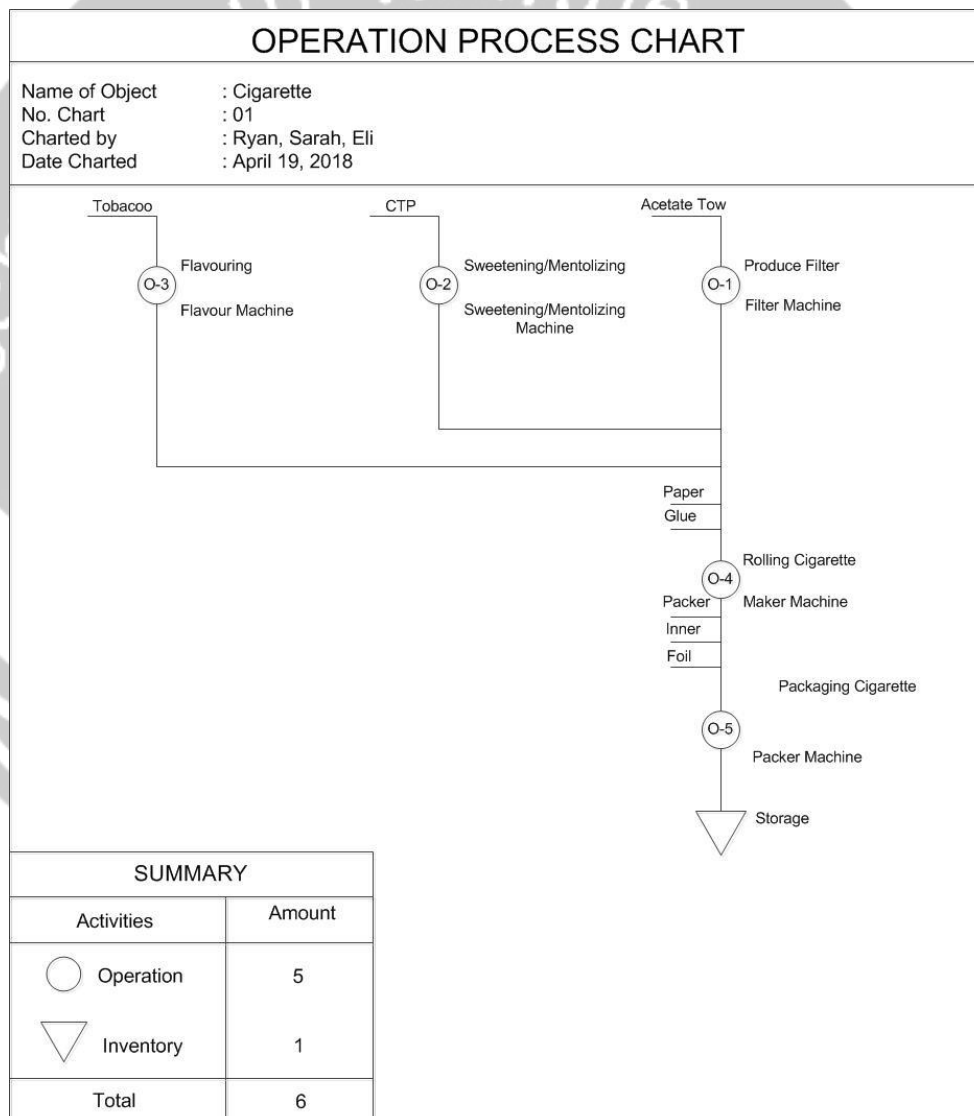
Figure 3.2. Operation Process Chart of Cigarette

PT. Djarum makes CTP and Acetate Tow on their own since all of those ingredients have specific material that already meets the customer's want. For tobacco, they get it from the farmer and in Primary plant they combined the tobacco with sauce (different for each types of cigarette). In Secondary then all of three main ingredients enter the maker machine in order to gain the cigarette rod. After that, the rod enter the packer machine to be packed as its type.

3.3.1. Production Resources

Production proces is a way or technique to make something through some steps from raw material that will experience many treatments in order to be a product that has function.

Production process will need to use resources. Resources are the main capital to start production process. Resources that are needed are as follow:

a. Materials

Materials can be any ingredients needed by the machines and workers in order to have usefel finished products for consumer.

b. Humans

Humans are an important part in the production process. Humans should plant and be the supporting element in the processing production because in PT. Djarum the QC most all the activities are done by the machine. Humans' role is to plant, operate, and mechanist in production process in QC.

c. Method

Methos is a way used to inspect the products in both visual and using a machine called QTM.

d. Money (capital/fund)

Fund here means money used to purcashe raw material, research's cost, employees' wage, electricity's bills, etc.

e. Machines

Machines are needed in production process becase in this factory the production runs in semi-automatic. From the bulb picking to filter's delivery process are done by machine (automated).

3.3.2. Raw Materials

In material procurement, PT. Djarum not only depends to one and only supplier. For raw materials there are finished blend's material, rods' material, and packaging.

a.   Filter Rod

Filters are mad by Hauni KDF machine with each machine's capacity is 395.000 rod/hour for Rak Gemini uses *porous* plug wrap. For non-*porous* plug wrap, KDF machine only can produce with capacity 247.000 rod/hour for Rak Gemini. New finished filters can be used after 4 hours.

Filters' raw materials are acetate tow, hotmelt, triacetine, inner glue, and plug wrap. There will be wastes in this production those are paper, loose acetate tow, and filters which are not meet the spesification. Rejected paper and acetate tow will not be used anymore; while filters are not meet the spesification will be sold to small cigarette factory. Here are the raw materials in making filter:

i.   Acetate Tow

Acetate tow is cotton like shape in white and thin but it is not separated in one roll. Acatate tow is the main raw material in making filter rod and filter roll. Filter roll is filter in roll like shaped. While filter rod is filter which already been cut in to rod in cigarette size. These acetate tow are imported from Japan, Germany, and United State.

ii.   Hot melt

Hot melt is in small cut in about 7 mm size. Hot melt is a yellowish square shape. These are for glueing the tip of plug wrap.

iii.   Triacetine

Triacetine is a white solution and is used to harden and shabby the acetate tow.

iv.   Inner Glue

Inner glue is solution-like to glue acetate tow and plug wrap. This is made from mix of triacetine and pieces of acetate tow.

v.   Plug Wrap

Plug wrap is a filter rapper, a white paper. Plug wrap is stronger than normal paper. There are two types of plag wrap; *porous* and non-*porous.*

3.3.3. Cigarette Paper

Paper is used to wrap the tobacco finished blend. Each Cigarette Maker (CM) needs 28 paper/day.

3.3.4. Cork Tipping Paper (CTP)

Cork Tipping Paper is a paper to cover the joint between tobacco rod and filter, CTP used should pass the CTP sweetener process (in pre-process).

3.3.5. Sweetener

Plain CTP then will pass the sweetener process using special solution that consists of glucose and alcohol. The goal is to make the CTP sweet.

3.3.7. Glue

It is used to glue paper, CTP, and also materials like aluminum foil, inner frame paper, etiket or blank, craft paper, and banderole. Its function is devided into two as follow:

a. Glue is used in cigarette making process (in cigarette maker) such as cigarette glue or side seam, it is used to glue between paper, and CTP glue which is used to glue Cork Tipping.

b. Glue which is used in packing process (in packer machine) that is glue 8605 which is for glueing etiket (blank) with inner frame.

3.3.8. Ink

Ink only used in Djarum Super product where ink is for the logo on the paper. In making the cigarette rod, suction tape and garniture tape are also used.

3.3.9. Production Facility

Facility layout can be defined as way to organize facilities in factory to support the production process. Production needs tools, equipments, machines, and other facitilies. All facilities should be plan in order to meet the production's need so that can result in best quality of finish good, finish in time and also minimize the cost. Planning the layout is an optimum option to locate machines and equipments, work area, storage and service facilities, together with the shape of the building.

PT. Djarum sets its production facility using product layout type. This type is a factory layout that has high efficiency in arranged equipment based on the process sequence. The production flow is in flow shop, where its characteristics are:

a.   The flow of material handling will work smoothly with lower cost.

b.   Total time needed is short relatively.

c.   The incentive system motivates employees to work productively.

d.   Every production or work station needs minimal area.

e.   Production process control can be easily done.

Each raw material or component that enters in production floor of PT. Djarum will experience many moves from one process to others. For example paper will be the main material to produce cigarette. Firstly it comes to the warehouse and then moves to the pre-process department to be processed. Every move needs material handling.

Material handling in PT. Djarum are done in many ways depends on the type and amount that must be moved also the position where the materials are in now. There are three types of material handling that usually used:

a.   Manual Handling

It is done by the operator without any machines' help. If there is no need to use special help and when the material moved is light so manual handling is done. For example when changing CTP and paper. Manual handling is done by operator in packing, operator move the bale into the box.

b.   Machine Handling

In this handling there's no help from human. It is more efficient for heavy work. It is used in moving press pack to manual packaging thru conveyor.

c.   Mix Handling

It is done by both human and machine, usually to move material between departments. For example moving material from manual packaging department to warehouse using forklift.

Most of the handlings are done by operator. Machine will be used if the materials moved are too heavy or in big amount. Material handlings' machines that are usually used in production process are as follow:

a. Forklift

Forklift is used to move raw materials and components. Maximum weight than can be handle is 2 tons.

b. Hand Truck

It is used to move small materials in big amount.

c. Roller Conveyor

It is used for assembly, inspection and moving products for assembly to manual packaging.

d. Pallet

It is a wooden board used to help the handling process.

e. Pallet Jack

Pallet jack is used to specially help to move pallet between departments. Pallet jack uses hydrolic system to adjust the height.

Quality control in PT. Djarum is handled by Quality Control department. Quality from products is important to keep consumers' trust. Quality control here consists of early material checking, process checking, manual packaging checking, and delivery checking. Unsuitable raw materials will be returned.

Each department in PT. Djarum applied quality control system in each production. In each production process operators will be check their own work so that it can minimize defective finished products.

CHAPTER 4
PROJECT REVIEW

4.1. Assignment Scope

Students are placed in the Secondary Engineering. The students are given right to use the pre-process and material preparation office. In the office, the supervisor is usually accompanied by one secretary. The layout of the office can be seen in Figure 4.1.

Student worked from 07.00 up to 16.00 WIB in Monday – Friday and in Saturday the time was lesser than usual that is from 07.00 – 12.00 WIB. Secondary engineering is responsible in the packaging until warehousing while Primary Engineering works with raw tobacco with sauce and flavour that will be ready to be made as cigarette.

Student worked in Production Department. This department is concerned on all of the production process happen in PT. Djarum SKM Gribig in three areas those are new building, old building, and export building. This team has responsibility to make sure that all the production process are working according to the schedules that already planned, make sure that there are no defective products and that the number of finished products are equal to the schedule.

Student had task to monitor the productivity of workers in HLP 63 machine then did a performance appraisal for each of the worker. This machine works to pack the cigarette into a LA Black Series with 16 rods in each then it will be given a banderole then pack into one press with 10 packs each. Student was helped and led by Mr. Martono as the production's supervisor with his unit heads they are Mr. Hasta and Mr. Yuli. The working hours took for doing the observation was in shift 1 that was in 06.00 – 14.00 WIB with the same group of workers to be observed. The observation should be done in one week because if the week was already changed so the group's working hours will be changed. For example group C was the object and in the first week they were in shift 1 so the second week they would be in the shift 3.
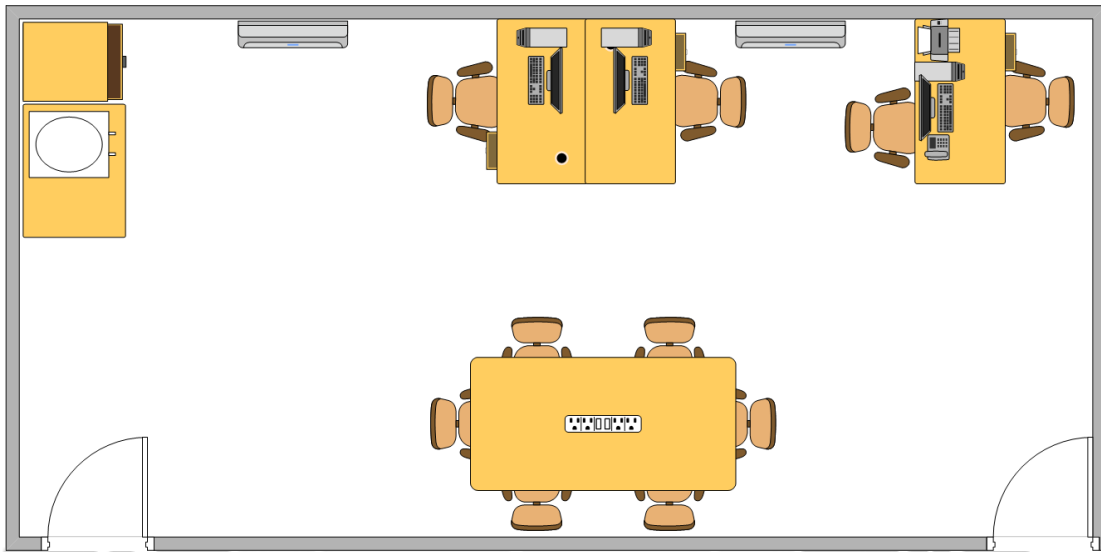
Figure 4.1. Pre-process and Material Preparation

4.2. Rights and Responsibilities

During 29 days of worked, student had rights as follow:

a. Student was permitted to enter all the production room and learn about the production process.

b. Student was permited to observe all the manufacturing process and communicate with the supervisors, unit heads, operators, and workers.

While the responsibilities given as the following:

a. Student should done the observation and report the result to the unit head and supervisor.

b. Student should give suggestion to the result.

c. At the last day, student should done a presentation in front of the manager, supervisors, and the unit heads in the Secondary Engineering of PT. Djarum SKM Gribig.

4.3. Methodology to complete the assignment

Student wanted to know the workload of workers and the best number of worker in machine HLP 63 after that student also will analyze the performance appraisal appropriate for workers so that they can improve their work in order to maximize the quantity and quality of the output. Methods used for supporting the observation were

productivity theory and performance appraisal. The steps taken for the productivity analysis was based on the productivity theory. Steps to do the observation given as following:

a. Define the object of observation with confidence interval and accuracy interval.
b. Measure and take note of time in each work element.
c. Choose the workers.
d. Choose days of observation.
e. Calculate the maximum random number, number of observation and hours of random visits.
f. Make and prepare for the observation sheet and pen. An example of observation sheet is shown in Table 4.1.
g. Give a score for each question with conditions (the score defined subjectively, as reference from a journal titled Tabel KPI and BSC by Yodia Antariksa, Msc.):
   i.   Very agree   = 5
   ii. Agree   = 3
   iii. Disagree   = 2
   iv. Very disagree   = 0
h. Ask foreman to fill the observation sheet which is shown in Table 4.2.
i. Doing interview with foreman of HLP 63 machine.
j. Make observation sheet which contained questions. The observation sheet can be seen in Table 4.2.

This observation was done since the workers in HLP 63 machine seemed had a small amount of workload and with three workers in one machine seemed too much. Besides student wanted to know the workers' performance whether their performance was already as what company wants or not. Therefore student done the observation to look further in workers and proved the analysis about productivity and their performance.

The observation's result was then calculated using Work System Design Analysis and Industrial Psychology subjects. Theories that were used are Work Sampling, Performance Rating and Allowance, Workload Analysis and Performance Appraisal.

Table 4.1. Observation Sheet

No.	Angka Random	JKA	Cleaning	Mengganti Foil	Mengisi Batangan	Mengisi etiket	Memasukkan ke dalam rak	Idle	Mengisi Pita Cukai	Mengisi Lem
LEMBAR PENGAMATAN PADA HLP 63 (Gedung Baru)										
Nama Pengamat :			Sarah Yohana							
Posisi :			PKL							
Hari, tanggal :			Pengamatan ke - 1							
Nama Pekerja :										
Jenis Kelamin :			Wanita							
Umur :			th							
1	0	6:00								
2	1	6:06								
3	2	6:12								
4	3	6:18								
5	4	6:24								
6	5	6:30								
7	6	6:36								
8	9	6:55								
9	10	7:01								
10	11	7:07								
11	12	7:13								
12	13	7:19								

Table 4.2. Observation Sheet of Performance Appraisal

PENILAIAN PERFORMASI PEKERJA HARIAN

Nama Pengawas :
Nama Pekerja :

No	Indikator	Penilaian			
		Sangat Setuju	Setuju	Tidak Setuju	Sangat Tidak Setuju
1	Pekerja fokus dalam melakukan tanggung jawabnya				
2	Sering mengobrol dengan pekerja lainnya				
3	Jam berangkat dan pulang tidak tepat waktu				
4	Sering meninggalkan tempat kerja				
5	Kembali ke tempat kerja setelah istirahat tepat waktu				
6	Produk yang dihasilkan berkualitas				
7	Mudah memahami penjelasan yang diberikan				
8	Mau menerima kritikan atau teguran serta saran				
9	Suka membuat keributan dengan pekerja lain				
10	Mampu bekerja sama dengan baik				

Keterangan skor :
5 sangat setuju
3 setuju
2 tidak setuju
0 sangat tidak setuju

TTD Pengawas
Kudus, 13 Januari 2017

4.4. Result of Project

In this sub-section will be explained about the observation's result.

a. Working Elements

The very first data to collect was the working elements. It was count starting from when the worker started to grab the thing they would move or operator until they finished. The working elements are filling cigarette rod, changing foil, filling etiket or blank, moving press pack into *rak kletek*, cleaning, filling banderole and filling glue. All the duration of the working elements were count using stopwatch in smarthphone and the unit was converted into second. The result is given in Table 4.3.

After data in the number 1 until 7 were gained the next step was calculate the observation unit and maximum random number. For observation unit it was the average of all duration of working elements then maximum random number has formula as follow:

$$8 \times \frac{3600}{observation\ unit} = maximum\ random\ number$$

Table 4.3. Working Elements

No	Working Element	Duration (Second)
1	Filling Cigarette Rod	21
2	Filling Foil	26
3	Filling Etiket/Blank	113
4	Move press pack to *rak kletek*	4
5	Cleaning	1800
6	Filling Banderole	2
7	Filling Glue	3
	Observation Unit	281.2857143
	Maximum Random Number	102.39

b. Data of Work Sampling's Observation

Observation was done when student already define the working elements which categorized as the productive activities and maximum random number. The maximum random number then could be used to define the hours of random visits. Maximum random number was obtained from multiplied working hours a day with 3600 second then devided by observation unit. Then using randbetween function in

Ms. Excel to help us generated the random number. Usually number of observation is two-thirds of the maximum random number, as the two-thirds of the maximum random number was 68.25 so it was rounded up became 70.

When the observation was conducted, the result became as shown in Table 4.4.

According to the data taken the most working element done frequently is moving pack press into *rak kletek*. This can happen because this activity is done continuously and can't have any little distraction. If the worker is careless then the pack press will be fall down and make a mess in floor. It will be a different case with trouble in machine, so the attention can be move a bit. Moving pack press becomes the most frequent activity done by all workers. Operator done this 62 times, helper A done this 59 times, and helper B 63 times. Then for the second most frequent activity is filling cigarette rod this can happen since the machine operates for 120 packs/minute and will result to each shift output 450 bale. Workers should pay attention with the cigarette rod level and they should not miss the low level where there is not enough cigarette to be processed.

For idle, the observer defined it as the workers leave the working area. Most causes happened because workers left for pantry to drink, take rest, sholat, and going to toilet. This idle is allowance like what already mention in allowance factor before. Most idle happened because the workers were taking rest. This usually happened between 09.30 until 11.30 WIB. Workers usually used up to 10 random numbers for taking rest. As the theory, rest time should be eliminate from the number of observation but due to the range of rest time in this company so we couldn't defined it at the first. Workers were only given one hour for rest with range from 09.30 up to 11.30 WIB. Then student observe that usually the workers took about 10 random numbers for rest maximum, when there was worker only took 8 then we took the maximum number to make it same. So number of observation which was 70 became 60 because of the elimination.

Table 4.4. Result of Work Sampling Observation

Day, Date	Workers	Cleaning	Filling Foil	Filling Cigarette Rod	Filling Etiket/Blank	Move to *rak kletek*	Filling Banderole	Filling Glue	Idle	Total
Monday, 8 Jan 2018	Operator	4	0	10	4	21	2	0	19	60
	Helper A	4	0	11	8	18	1	1	17	60
	Helper B	4	1	11	6	20	1	0	17	60
Tuesday, 8 Jan 2018	Operator	3	1	5	5	24	2	0	20	60
	Helper A	3	0	12	5	20	6	2	12	60
	Helper B	3	0	12	2	20	4	0	19	60
Wednesday, 8 Jan 2018	Operator	7	1	16	2	17	1	0	16	60
	Helper A	4	0	11	8	21	4	1	11	60
	Helper B	4	0	8	4	23	6	0	15	60

c.   Data of Percent Productivity

After all the data are collected in Table 4.5. was the summary of productive and non-productive activity per day.

From the Figure 4.5. then did the calculation of productivity percentage. The calculation formula is given and the results were shown in Table 4.6.

$$\% P = \frac{number\ of\ productivity\ activities}{total\ observation} \times 100\%$$

Take Wednesday as the example, helper B had 45 productive activities. Then it will be devided by 60 that was total observation in that day so the percent productivity in Wednesday was 75%. When all the percent productivity for each worker in each day already calculated then did calculation for percent productivity of each worker in total observation. It was by did average calculation for each worker in each day. The result was helper A had the highest percent of productivity among others which was 77.78% then for operator and helper B were 69.44% and 71.67% respectively. For the non-productive percentage was done the same way. The highest was operator with 30.56% it might be because the operator frequently left the working area to have briefing with foreman.

Table 4.5. Total Activity per Day

	Productive	Non Productive
Monday, 8 Jan		
Operator	41	19
Helper A	43	17
Helper B	43	17
Tuesday, 9 Jan		
Operator	40	20
Helper A	48	12
Helper B	41	19
Wednesday, 10 Jan		
Operator	44	16
Helper A	49	11
Helper B	45	15

Table 4.6. Percent Productivity

	Total-P	Productivity	Percentage-P	Total-NP	Percentage-NP
Operator	125	0.6944	69.44%	55	30.56%
Helper A	140	0.7778	77.78%	40	22.22%
Helper B	129	0.7167	71.67%	51	28.33%

Where : P   = productive activity

NP   = non-productive activity

% P   = percent of productivity

d.   Test of Adequacy Data

It is done to know whether total observation we took is enough or not. In this test we should compare N or total observation with N' or the adequacy data. Data will be defined as enough when N is more than N' otherwise if N is less than N' so it will be defined as not enough. The formula is as follow and the results represented in Table 4.8. with Tabel 4.7. represent any needed data for calculation.

$$N' = \frac{k^2(1-p)}{s^2 p}$$

Where : N'   = adequacy data

k   = contant of confidence interval

s   = accuracy interval

Data adequacy test is to know whether our number of observation is enough or not. k was defined from the confidence interval, observer chose 95% as the confidence interfal so that has k equal to two, bellow 68% is 1 and 99% of confidence interval has 3 for k. N here was all the number of observation which was 180 because each day the number of observation was 60 then N' got from the calculation. Since all the workers had N' which were 176, 114.29 and 158. 14 for operator, helper A and helper B respectively so those indicated that the datas were enough since N' was lesser than N. Data adequacy is based on number of productive activity which already exceed a half of the number of observation. The test will give result as not enough if total of productive is less than total of non-productive so it means the observer should take more observation in order to make it enough.

Table 4.7. Confidence Interval (CI), Constant of Confidence Interval (k), and Accuracy Interval

N	180
CI	95%
k	2
s	10%

Table 4.8. Productivity Percentage and The Adequacy Data

	Total-P	Produktivitas	Persentase-P	Total-NP	Persentase-NP	N'
Operator	125	0.6944	69.44%	55	30.56%	176.00
Pembantu A	140	0.7778	77.78%	40	22.22%	114.29
Pembantu B	129	0.7167	71.67%	51	28.33%	158.14

e. Uniformity Data Test

Uniformity data test is used to know whether the datas are uniform or not. It will be said as uniform if all the datas are in the control limit. In this test we use upper control limit and lower control limit with formula as follow:

$$UCL = p + k \sqrt{\frac{p(1-p)}{n}}$$

$$LCL = p - k \sqrt{\frac{p(1-p)}{n}}$$

with: p   = percent productivity

k   = confidence level

n   = number inspected in a subgroup

UCL   = upper control limit

LCL   = lower control limit

i. Operator Data

In this part will be shown the result of productivity by operator. As can be in Table 4.9. it is the summary of datas which were known and calculated. The p was gained from the average of percent productivity of operator.

After the control limit of upper and lower were gained then we made a graphic to illustrate the control limit so that it would be clear. The graphic can be shown in Figure 4.2.

Table 4.9. Control Limit

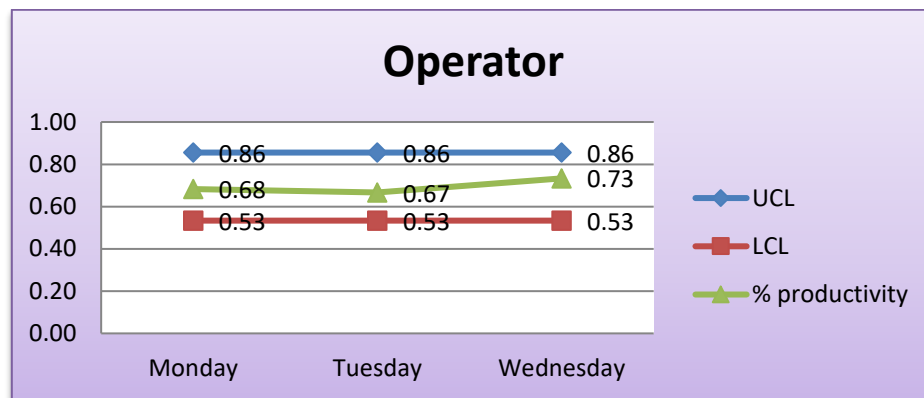| p	0.69
n	60
UCL	0.86
LCL	0.53

Figure 4.2. Graphic of Control Limit of Operator

ii. Helper A Data

In this part will be shown the result of productivity by helper A. As can be in Table 4.10. it is the summary of datas which were known and calculated. The p was gained from the average of percent productivity of helper A.

Table 4.10. Control Limit

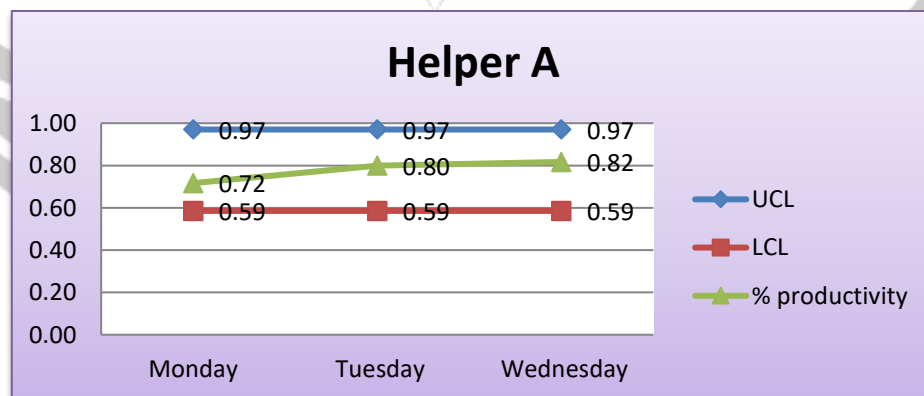| p	0.78
n	60
UCL	0.97
LCL	0.59

Figure 4.3. Graphic of Control Limit of Helper A

iii.   Helper B Data

In this part will be shown the result of productivity by helper B. As can be in Table 4.11. it is the summary of datas which were known and calculated. The p was gained from the average of percent productivity of helper B.

After the control limit of upper and lower were gained then we made a graphic to illustrate the control limit so that it would be clear. The graphic can be shown in Figure 4.4.

Uniformity test is used to make sure observer that the sample taken is from the same population. This will have control limit graphic as the output. Datas will be said as uniform when it is still in the control range. The calculation then was made as already given in the formula above. We should prepare for p-bar or final percent productivity and N bar or number of observation each day. After did the calculation the upper and lower control limit for operator were 85.55% and 53.34% then for helper A were 97.02% for upper control limit and 58.53% for lower control limit, for helper B the upper control limit was 88.66% and 54.67% for the lower control limit. Graphics were than made and those showed that no datas were lower or higher then the control limit so it meaned that the datas were none out-of-control.

Table 4.11. Control Limit

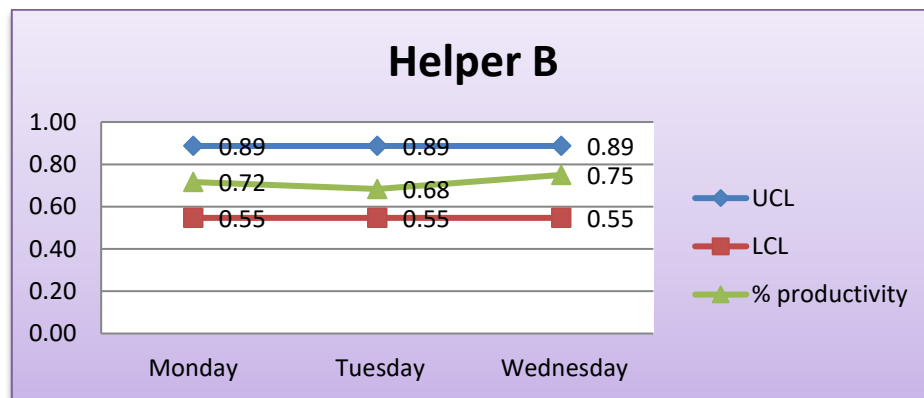|	
p	0.72
n	60
UCL	0.89
LCL	0.55

Figure 4.4. Graphic of Control Limit of Helper B

f. Performance Rating

Performance rating is a method done to compare performance between workers by using perception from observer about how normal performance is. Usually it is a subjective scoring. Performance rating is used to normalize working hours.

Score from performance rating usually symbolized by p where it will have score and means as follow:

i. $p>1$ or $p>100\%$ means that the worker works too fast or more than normal.

ii. $p=1$ or $p=100\%$ means that the worker works normally.

iii. $p<1$ or $p<100\%$ means that the worker works too slow or bellow normal.

Westinghouse is one of way to do performance rating. It was introduced by Westinghouse Company in 1927. There are four factors in measuring the system;

i.   SKILL is worker's ability to follow the way of work that already applied.

ii. EFFORT is a seriousness of worker in doing his/her work.

iii. CONDITION is environment's condition physically where the worker works.

iv. CONSISTENCY is fact that every result in measure the time will be different.

Each factor has its own category such as superskill, excellent, good, average, fair and poor. It will be describe bellow in Figure 4.5.

The student as an observer defined that all workers here didn't work in different speed since they all followed the machines speed. So student then defined that the performance rating was normal for all workers and become like Table 4.12.

Performance rating here was given according to how normal work was in observer's perception. Since all the workers were depend on the machine's speed so there was none of worker that had higher speed or lower since it was a must of them to follow the machine's speed. It was impossible for workers worked faster in moving the press pack since they should wait for the machine to finish pressing. The workers were worked normally so student decided to give D score and it resulted in the score of performance rating which was 1.

Figure 4.5. Westinghouse System

Table 4.12. Performance Rating

Workers	Westinghouse system				PR	Note
	Skill	Effort	Condition	Consistency		
Operator	D = 0	D = 0	D = 0	D = 0	1	Average/normal
Helper A	D = 0	D = 0	D = 0	D = 0	1	Average/normal
Helper B	D = 0	D = 0	D = 0	D = 0	1	Average/normal

g. Allowance Factors

Allowance is things that are tolerated for individual needs of each worker by the observer. Individual needs are such as drink and going to toilet. Each individual needs for workers are different with each other, woman and men are also different. If individual needs are not fulfilled it may be decreased the productivity of the workers. Allowance can be also decreased fatigue if it is not fulfilled can also decreased the quality of working. Besides there also allowance that is unavoidable such as worker is given a direction by the foreman, doing adjustment for machine, or take things from warehouse. Bellow is allowance table in Figure 4.6.

In calculating the allowance factors we should use average for score that has range. Allowance is applied for each worker and if in one category there are two possible options so choose condition which is toughest. The student then decided the factor as follow in Table 4.13.

Allowance factors then defined. This will be about the effort taken out by the worker, work attitude, work motion, eyes' fatigue, work temperature, atmosphere, and environment condition. Before defined the factors we can take a look on the working area bellow in Figure 4.7.

There will be workers in three positions. In machine HLP number 3, the worker should be ready to change the foil, inner, and refill the cigarette rods. The worker in front of her will mobilize in filling the etiket, banderole, and glue. The last worker will be in charge for moving the press pack to the *rak gemini*.

First factor is work force. The first worker will have the heaviest work that is standing while holding *rak gemini* that is full of cigarette rod and place it above her head on machine HLP. Its weight is about 2 kilograms and other standing work that is done is filling the banderole which weight is so small. Here the heaviest is still filling rod so the allowance is the average of standing with weight about 2 kilograms and become 6.57%.

Second factor is the work attitude. The same with factor of work force, the student choose only one factor which is the heaviest. The heaviest work here is standing

with two feets. It is based on the worker who fills the cigarette rod, glue, banderole, and etiket. The average becomes 1.75% for this factor.

For work motion we choose the heaviest again. Since their work is in normal condition like in filling the etiket there is no special motion so this factor will be worth 0%.

Eyes fatigue is based on the worker's view. All the workers here have discontinuous view. This means that the workers don't focus too much in one object and can be move to another object. Worker in moving the press pack will not always look at the moving pack but should look at stamper machine, it stamps well or not. So the allowance will be 3% of average with good lighting.
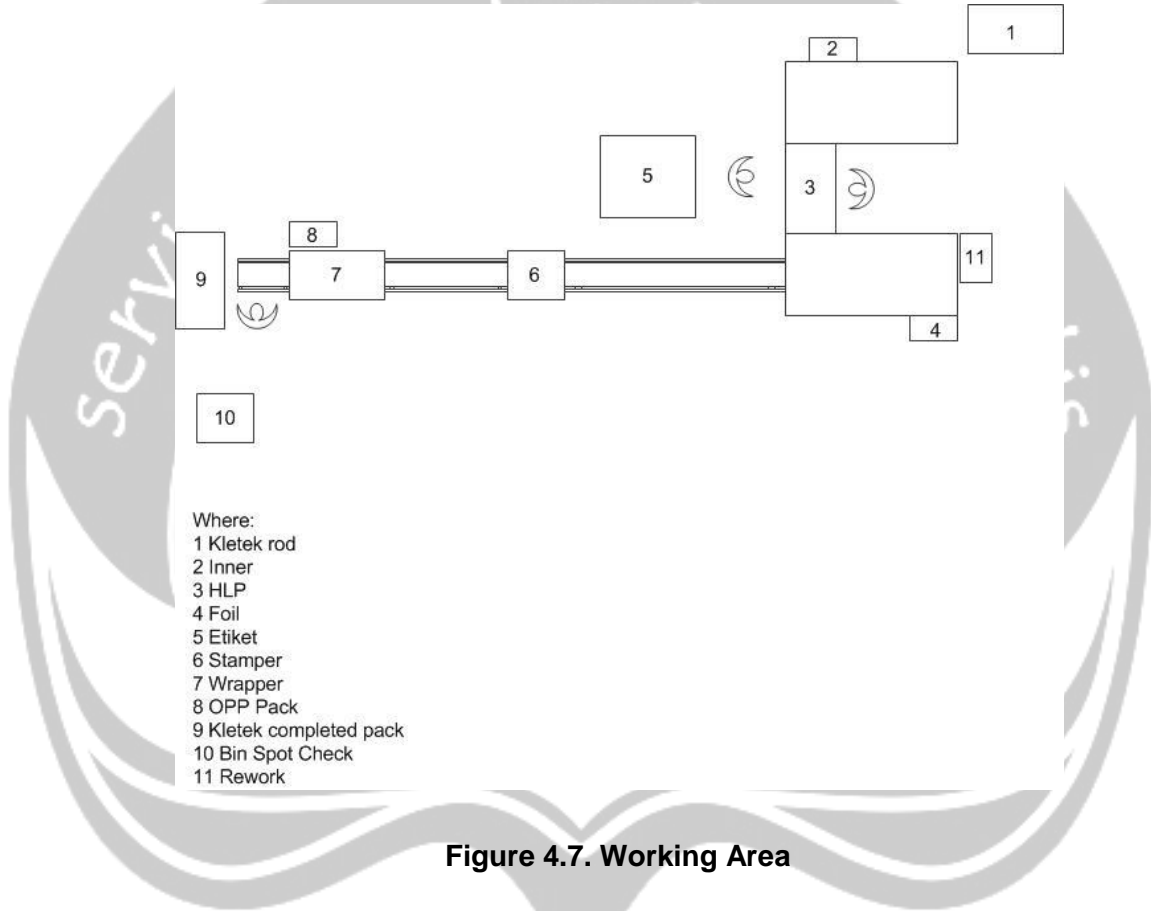
Work temperature is normal with normal fatigue so the allowance becomes 2.5%. While for the atmosphere, it is considered as enough because the ventilation is poor with odors from the tobacoo so the score will be 2.5%. then the last will be for the environment condition, the condition is noisy because of the machines so the allowance becomes 2.5% too.

Factor	Job Example	Equivalent Load	Allowance	
A. Energy released			Male	Female
1. Can be ignored	Working at the desk, sitting down	No load	0.0-6.0	0.0-6.0
2. Very light	Work at the table, stand up	0.00-2.25 kg	6.0-7.5	6.0-7.5
3. Lightweight	Shoved lightly	2.25-9.00	7.5-12.0	7.5-16.0
4. Medium	Hoeing	9.00-18.00	12.0-19.0	16.0-30
5. Weight	Swinging a heavy hammer	18.00-27.00	19.0-30.0	
6. Very heavy	Shouldering loads	27.00-50.00	30.0-50.0	
7. Unbelievably heavy	Bear heavy sacks	Above 50 kg		
B. Work attitude				
1. Sit down	Working sit, light		0.00-1.0	
2. Stand on two legs	Body upright, supported by two legs		1.0-2.5	
3. Stand on one leg	One leg working on the controller		2.5-4.0	
4. Lie down	On the side, back or front of the body		2.5-4.0	
5. Bending	The body is bent on both legs		4.0-10.0	
C. Work Motion				
1. Normal	Swinging a heavy hammer		0	
2. A bit limited	Limited swing from the hammer		0-5	
3. Hard	Carry heavy loads with one hand		0-5	
4. Only for limited limbs	Working with hands overhead		5-10	
5. All limbs are limited	Working in mines		10-15	
D. Eyestrain			Good Lights	Bad Lights
1. Dijointed view	Read measuring instrument		0	1
2. Almost continuous view	Meticulous work		2	2
3. Continuous view with changing focus	Check for defects on the fabric		2	5
4. Constant view with fixed focus	A very thorough examination		4	8
E. Workplace temperature conditions	(temperature degree celcius)		Normal Weakness	Excessive
1. Frozen	Below 0		Above 10	Above 12
2. Low	0-13		10-0	12-5
3. Medium	13-22		5-0	8-0
4. Normal	22-28		0-5	0-8
5. High	28-38		5-40	8-100
6. Very high	Above 38		Above 40	Above 100
F. Atmosphere				
1. Good	Well ventilated room		0	
2. Enough	Bad ventilation, odors		0-5	
3. Not good	Toxic dust, or non-toxic but numerous		5-10	
4. Bad	Harmful odors that require to use breathing apparatus		10-20	
G. Good environmental conditions				
1. Clean, healthy, bright with low noise			0	
2. The work cycle repeatedly between 5-10 seconds			0-1	
3. Repetitive work cycle between 0-5 seconds			1-3	
4. Very noisy			0-5	
5. If influencing factors can degrade quality			0-5	
6. Feel the vibration of the floor			5-10	
7. Exceptional circumstances (sound, cleanliness, etc.)			5-15	

Figure 4.6. Allowance Factors

Table 4.13. Allowance Factors

Workers	Category of Allowance							Σ %
	A	B	C	D	E	F	G	
Operator	6.75%	1.75%	0.00%	3.00%	2.50%	2.50%	2.50%	19.00%
Helper A	6.75%	1.75%	0.00%	3.00%	2.50%	2.50%	2.50%	19.00%
Helper B	6.75%	1.75%	0.00%	3.00%	2.50%	2.50%	2.50%	19.00%

Where:
1 Kletek rod
2 Inner
3 HLP
4 Foil
5 Etiket
6 Stamper
7 Wrapper
8 OPP Pack
9 Kletek completed pack
10 Bin Spot Check
11 Rework

Figure 4.7. Working Area

h.   Workload Analysis Data

Workload analysis is done to know how many loads are borne to finish the work by the workers. Through this analysis we can know how many workers are needed in one machine. If the load exceeds 100% so we can ease the load by add more workers. Workload can be calculated as follow:

$$workload = (\%productivity \ \times performance \ rating) \times (1 \ + allowance)$$

Then to know whether the load exceeds or not can be calculated with formula bellow:

$$workload\ average = \frac{total\ weight}{number\ of\ workers}$$

From the datas that are already got from the observation we can get the result in the Table 4.14.

After all the calculation it was time to deal with final goal which was workload analysis. The result showed that there were no workers whose load exceeds 100%. For helpers, they borne 177.84% of load but since there were two workers so the load became 88.92% each. In calculating helpers we should first adding the final percent of productivity for each then calculated using workload analysis's formula. Since there were 2 helpers so the load was then divided by two. Then for the operator the load was 82.64% and it was enough to be borne by one person. So the result was three workers in one machine were enough since the load was still bellow 100%. By decreasing the workers into two would give tight allowance for helper since she might have lower allowance and it will lead to decrease of productivity too.

Table 4.14. Workload Analysis Data

Workers	Load	Existing Workers	Load/person
Operator	82.64%	1	82.64%
Helpers	177.84%	2	88.92%

i.   Performance Appraisal Data

Performance appraisal is better done by foreman, peers, subordinate, self, and client. The reason why all of them become the best scorer as they involve directly with worker from the service, communication when giving command, team work, and receiving direction.

The criterias should be given by company that is called Key Performance Indicator or KPI and then it will be compared with criterias from the scorer. But since PT. Djarum doesn't have KPI so all the criterias are made by the foreman, so this scoring is very subjective and is not detailed. The result is given in Table 4.15.

Foreman is worker that directly involves in works of workers in HLP 63, especially group C. So the foreman knows well the attitude of the workers. Since PT. Djarum

didn't have Key Performance Indicators so the competence aspects are made by the foreman.

The competences are taken from the wishes the foreman wants to be done by the workers. Foreman wants the worker to be focus, act more, appreciate time with doing everything in time, produces products in good quality with always do the spot check, foreman also wants their workers to not leave the working area, understand each explanation well, not feel offended if given a critic, lesson or suggestion, and have good teamwork.

Student then lists all the competences and giving score toward each statement. Very agree with 5 score, agree with 3 score, disagree with 2 score and very disagree with 0. The total score for very agree in each competence will be 100. After the foreman done in giving score for each worker so the highest was operator with 62 score and helper A and B both had the same score that was 50.

The next action was student gave category for each score with 0-45 to giving training again, 45-75 means the feedback should be increase, and 75-100 means there should be maintain the score. Based on scores that is already got so the student concluded that each worker needed feedback more in order to increase their score. Giving the feedback can be in form of praise, giving coffee break, and giving reward like best worker of the month.

Table 4.15. Performance Appraisal Result

Workers	Scoring				
	Very Agree	Agree	Disagree	Very Disagree	Total
Operator	15	12	4	0	62
Helper A	0	21	4	0	50
Helper B	0	21	4	0	50

CHAPTER 5
CLOSING

5.1. Conclusion

As all the steps were done and analysis was conducted so the last was to take the conclusion. The first objective was to know the workload level of each worker and each worker didn't endure more than 100% so the number of three workers is already best enough. Then for the performance appraisal was just in average level and still need more improvement for each worker to be motivated enough to do their work in order to get best quality.

5.2. Suggestions

Percent productivity of each worker had been reached a good number since it was already higher than 50% while the performance appraisal was also good. Company should be keep the score in the highest and motivate others to reach higher score more.
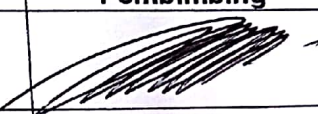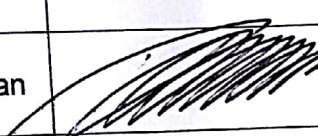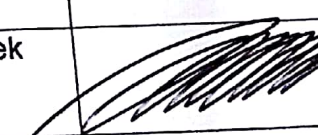
Feedbacks given for the workers are needed in order to increase their productivity and their performance. Feedback is not just talk about wage but can be in form of verbal movitation. It can be also giving a coffee break time in a certain period of time in the middle of working hours, foremand and unit head can also start by giving small attention and verbal motivation like praise the work, giving award like best worker of the month title to worker that has highest score by displayed his or her photos on the production floor, and it can also be giving a cheap market for certain period so that workers can get staple food in low price without really harm the company.

REFERENCES

Akinbowale, Michael A., Lourens, Melanie E. dkk. 2013. *Role of Performance Appraisal Policy and Its Effects on Employee Performance*. Makalah dipresentasikan pada European Journal of Business and Social Science, Vol. 2, No. 7, Oktober, Durban.

Babatunde Joseph, Osabiya. 2014. *Effectiveness of Performance Appraisal as a Tool to Measure Employee Productivity in Organisations*. Volume 4. No 4. Nigeria: Macrothink Institute.

Mackey, K. & Johnson, G. (2000). *The Strategic Management of Human Resources in New Zealand.* Auckland: Irwin/McGraw-Hill.

Nanda Wibawa, Raissa P., Sugiono, Yanuar Efranto Remba. *Analisis Beban Kerja dengan Metode Workload Analisis Sebagai Petimbangan Pemberian Intensif Pekerja.* Malang: Universitas Brawijaya.

Puspita Andriani, Debrina. 2015. *Penentuan Rating Performance & Allowance Analisa dan Pengukuran Kerja*. Malang: Universitas Brawijaya.

Restu, dkk. 2012. *Practicum APK Industrial Engineering.*

Sarma Sinaga, Tuti dan Tryana Sembiring, Meilita. 2004. *Work Sampling Studi Kasus Pekerjaan Bertender Pada Sebuah Café.* Sumatera Utara: Universitas Sumatera Utara

Program Studi Teknik Industri Universitas Atma Jaya Yogyakarta
Lembar Bimbingan Pelaksanaan dan Penyusunan
Laporan Kerja Praktek/ Magang

Nama Mahasiswa : Sarah Yohana

NPM : 151408369

Perusahaan tempat KP : PT. Djarum

Tanggal pelaksanaan KP : 18 Des – 24 Januari 2018

Dosen Pembimbing : Brilianta Budi N.

No	Tanggal	Agenda	Tanda Tangan Dosen Pembimbing
1	29 /11 /2017	Penyerahan surat pembimbingan dan Konsultasi persiapan Kerja Praktek	
2	22 /12 /2017	Laporan atau konsultasi penugasan dari perusahaan	
3	5 /2 / 2018	Laporan pertama setelah pelaksanaan Kerja Praktek dan konsultasi penyusunan laporan	
4	7 /3 /2018	Penyerahan draft laporan Kerja Praktek untuk pertama kali	
5	14 /5 /2018	Pengesahan laporan Kerja Praktek	