



Faculty of Engineering

Department of Textile Engineering

Study on Non-Productive Time (NPT) in Knit Garment
Production

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Science in Textile Engineering**

Apparel Manufacturing Technology

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LETTER OF APPROVAL

November 16, 2021

To

The Head

Department of Textile Engineering

Daffodil International University

Daffodil Smart City, Ashulia, Dhaka

Subject: Approval of Project Report of B.Sc in TE Program

Dear Sir,

I am just writing to let you know that this report titled as “Study on Non-Productive Time (NPT) in Knit Garment Production” has been prepared by the student bearing ID 173-23-5202 is completed for final evaluation. The whole report is prepared based on the factory data with required belongings. The students were directly involved in their Thesis activities and the report become vital to spark of many valuable information for the readers.

Therefore, it will highly be appreciated if you kindly accept this report and consider it for final evaluation.

Yours Sincerely

A handwritten signature in black ink, appearing to read 'Md. Mominur Rahman', is written over a circular stamp.

16.11.21

Md. Mominur Rahman

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DECLARATION

I hereby declare that the work which is being presented in this thesis entitled, “ Study on Non-Productive Time (NPT) in Knit Garment Production” is done by myself .It has not been presented for a degree of any other university and all the materials of collected information for this report been duly acknowledged.

Submitted by	ID	Signature
Abdullah Hasan	173-23-5202	<i>Abdullah Hasan</i>

This is to certify that the above declaration made by the candidate is correct to the best of my knowledge.

Supervisor

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I thankful my parents who always support me & motivate me & also for their financially support.

Finally , during thesis report making I gather knowledge. It helps me to create some skilled which support me in future of my job life.



ABSTRACT

This thesis report present Study on Non-Productive Time (NPT) in Knit Garment Production. Has worked on this report because of non productive time (NPT) is the main reason for low production . It has been observed 8 hours to collect some non-productive time data and captured different type of problem. Strong production planning with proper work on Non-Productive Time then achieve proper bulk, productivity improved , reducing lost time .This thesis report it has been found one month internal and external cause of Non-Productive time. Here also it has been found some major NPT problem. It has been found monthly total available min / working time 165,120, monthly total non-productive time (NPT) 12512 , monthly total produce minute 152,128. NPT percentage 8%.



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CHAPTER-1
INTRODUCTION



Chapter 1

Introduction

1.1 Background of the Study

In Textile Engineering NPT means Non-Productive Time. The time that is spent by an operator without producing any garment like 'set up time' is called non-productive time. It measure to find out the standard lost time. This is the major problem of low production and less efficiency in garments manufacturing. This thesis known as a research paper which provide sufficient information .This thesis contains **Study on Non-Productive Time (NPT) in Knit Garment Production**. In garments industry NTP hamper the production. Non-Productive Time (NPT) count for getting how much standard time lost due to machine stoppage time. That's it, it is important to reduce non productive time and measure for find the reasons of machine stoppage or reasons of low production. So I select this thesis to find out this problem .

1.2 Objectives of the Study

The Objectives of the thesis are given below:-

1. To analyze the Non-Productive Time of one month
2. To summarize Non-Productive Time for a month

1.3 Importance of the study

Researcher: This thesis report I try to show monthly NTP time. The researcher use that term that I used it in this thesis report to find out the NTP time for different type .

An General person can learn something from this report. How ntp impact on the production
Factory employ : Factory employ apply that term and how they overcome ntp time for better production capacity

Student can learn what is NTP time and how it impact on the production



CHAPTER-2

LITERATURE SURVEY



2.1 Causes of Non-Productive Time(NPT)

Causes can divide into internal and external

1. Internal

causes:

- Machine Breakdown
- Decision making delay
- Quality checking delay
- Re-work
- Man power Crisis/leave
- Fabric Searching Delay
- Lay Delay
- Cutting mistake
- Cutting Delay
- Fabric Relax Delay
- Re-cut Delay



1. External causes:

- Pattern Mistake
- Marker Delay
- Fabric Approval Delay
- Fabric delay
- Color sheading
- Print mistake
- Print Delay
- Print approval delay
- Embroidery delay
- Embroidery mistake
- Accessories delay
- Input supply delay
- Power failure
- Salary payment effect
- Approval delay
- Re-feeding
- Machine Delay



2.2 Some Internal causes discuss below:

★ Machine breakdown

Machine breakdown highly impact on the production. It means when it stops working due to internal malfunction and it required the replacement or repair the equipment. The problem are cutter ,motor, sensor, Load sheading etc.

★ Quality Checking delay

In quality checking area there are two operator they checking quality properly if they found any problem like fault , fabric shade, spot then they give it replace area. The Product may not pass due to quality problem. Quality Check and quickly decision making.

★ Decision making Delay

Management decision late that's why production hamper. In cutting section decision making delay hamper the production because they found any problem like Lay ,cutter decision ,numbering, Bundling etc. but they cannot solve this problem in proper time for late decision

★ Supervision Problem

For supervision in cutting floor the supervisor always monitor if they not properly monitoring then for their supervision problem NPT may produce. Problem like Lay, numbering, bundling etc.

∴



★ **Re-Work**

For any fault found or anything new add into garments and do that work again as like as if I found any hole problem then I cut same fabric and replace their sticker that is re-work. Should be required experience operator

★ **Manpower Crisis/leave**

In the cutting floor operator or helper may absent or maybe they leave and NTP produce

★ **Fabric Searching Delay**

It is too late to find the fabric at the right time and NPT produce

★ **Lay Delay**

For any problem found and That's may not lay in proper time. As like as I have machine, fabric, Man Power but there are cutting problem, space problem that's why fabric delay

★ **Cutting mistake**

Cutting mistake means wrong bundling and wrong numbering may done and wrong marker may use into lay ,cutter operator may mistake during cutting fabric



★ Cutting delay

Cutting delay may happen for waiting next lay or waiting for marker, man power crisis, machine problem. NPT will produce

★ Fabric relax delay

If the fabric should not be maintained at least 24 hours from starting date, time then cut without relaxing the shrinkage may happen on garments component after cutting

★ Re-cut Delay

The more rejections, the more time it will take. Basic product takes less time (two sleeve, front, back), Critical product takes more time (Back, front, Pocket, Bottom, Cuff etc.)



2.3 Some External causes are discuss below

- **Pattern mistake**

Design, fit ,pattern of different garments parts made on the pattern paper. If used wrong pattern

- **Marker delay**

The marker comes from the cad .If it not arrived into cutting then fabric will sit. NTP will produce

- **Machine delay**

For machine problem machine may be need replace during that time production stop and NPT produce

- **Fabric delay**

Fabric not arrive into cutting in proper time, operator idle and NPT will produce.

- **Power failure**

Short term or long-term loss of the power or power outage it's called power failure. For the garments factory all machine will be stop. For that reason lose the available time & increase NPT.



- **Print Delay**

Cutting garments body parts may need print. If print body part not arrive in proper time For pairing with other parts work will be stop operator will sit idle.

- **Print Mistake**

Buyer always mention the print placement in the tack pack. If this print placement not done properly that is print mistake. Print mistake happen - missing word, text that's are too small, spelling error, position, color, shade problem

- **Print approval delay**

Printing not done according to design , position, color, shape, size for that reason print approval delay and NTP will produce.

- **Embroidery Mistake**

Embroidery not done according to color, position, size

- **Embroidery Delay**

If embroidery parts not arrive in proper time then operator will sit idle so that non- productive Time produce.

- **Approval delay**

To produce a standard product then needed standard material & ensure the standard material also need approval. If any reason this approval to be late it's called approval delay



- **Color shading**

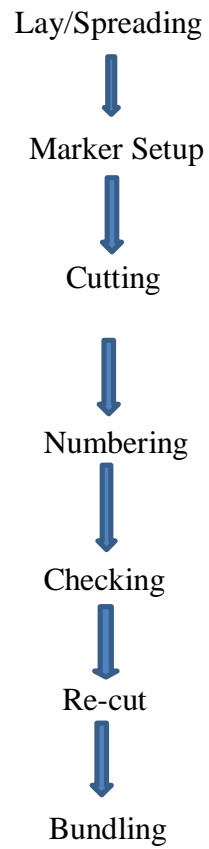
During cutting color problem may found . When dyes cannot migrate properly in the whole fabric it show different color or color depth difference in the same fabric. shade

- **Accessories delay**

If the supplier cannot delivery on time. Accessories are Hangtags ,price tag, polybag ,Tissue paper , Hanger, Gum tape, Export Carton etc.



2.4 Cutting Internal Process :-



2.4.1 Cutting Internal Process Picture:-

Figure 2.4.1.1 Cutting Internal Process Picture



Spreading/Lay

The process unwinding big roll of fabric into long and wide table in preparation. It done by machine or hand. It depending above the fabric and cutting technology up to 70-80 single jersey layer fabric cut one time.



Marker Setup

The marker setup comes from cad section which gives accuracy, increase control over variable and reduce the time required.



Cutting

Cutting is done straight knife machine. Cutting process garments component are separated. In Cutting the marker is cut at a specific shape. Inaccurate cutting cause hold ups in Production and it means the costly re-cutting components. Productivity depend on performance of cutting section.



Numbering

Separated garments component are numbered to ensure that stitching all component from stitched together. To avoid shade variation. Worker/operator can set the numbering format for each style marker as desire. After cutting the sticker is attached. In this picture typical equipment used also called as ply numbering machine/layer numbering machine/ layer marking machine .Mass garments manufacturers use this device.



Checking

Properly checking to find out any problem like fabric problem, spot, reject body, bundle short (Quantity 20-18), hole. Reject product allowed to be re-cut.



Re-cut

Re-cut means to cut again .In bundling found many reject product, Shade variation, Oil spot, patta, hole.

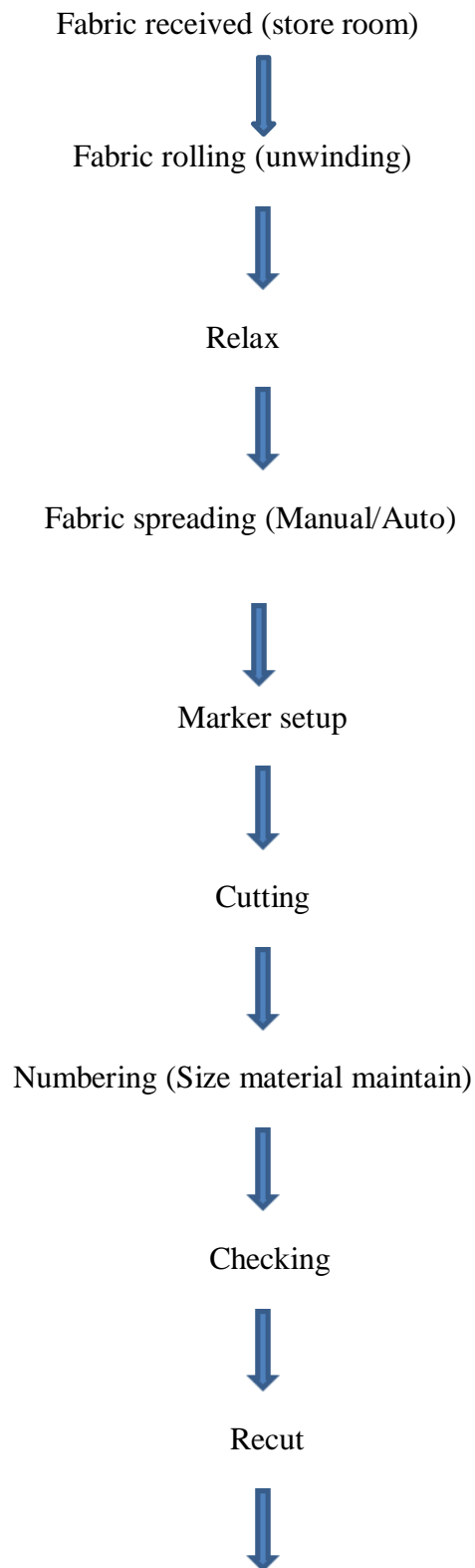


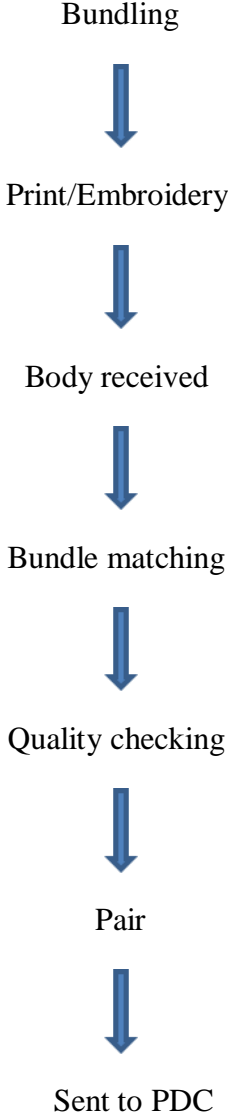
Bundling

A certain number of pieces with all component are tried together and this process known as bundling. Bundle marked with bundle number, style name, size number and quantity pieces in that bundle. If there is more purchase it takes more time.



2.1 Cutting Flow Chart







CHAPTER-03

EXPERIMENTAL DETAILS



3.1 Non-productive time of each week has been calculated. In cutting section I worked 8 hours per day to collect this data. Their code is given below:-

Table: 3.1.1 Data Collection of Non-Productive Time (NPT)

CODE					
Internal			External		
Code	Details	Code	Details	Code	Details
MB	Machine Breakdown	PTM	Pattern Mistake	PF	Power failure
DMD	Decision making delay	MD	Marker Delay	ED	Embroidery delay
QCD	Quality checking delay	FAD	Fabric Approval Delay	EM	Embroidery mistake
SP	Supervision Problem	FD	Fabric Delay	ACD	Accessories delay
RW	Re-work	OTS	others	MD	Machine Delay
MC	Manpower Crisis/ leave	CS	Color sheading	APD	Approval delay
SCD	Style change delay	PM	Print mistake	SPE	Salary payment effect
DH	Deduct hours	PD	Print Delay		
CM	Cutting Mistake	PAD	Print Approval Delay		
CD	Cutting Delay	ED	Embroidery Delay		
FRD	Fabric Relax Delay				

3.2 Non-Productive Time (NPT) for Cutting Section (Week 1)

Table 3.2.1 Non-Productive Time (NPT) for Cutting Section (Week 1)

Working hour: 08

No of worker: 12

Date	Cause (Code)	Details	Processes	Time Start	Time End	NPT in Min	Affected worker	Total NPT (affected Worker × NPT)
01/09/2021	FD	Fabric Delay	Lay	7:30	9:00	90	12	1080
	LD	Lay delay	Lay	12:00	12:20	20	4	80
	CD	Cutting Delay	Lay	4:10	4:30	20	4	80
02/09/2021	MB	M/C Breakdown	Cutting	10:20	10:50	30	2	60
	MD	Marker Delay	Cutting	12:00	12:15	15	1	15
	PF	Power failure	All	2:10	2:12	02	161	322
03/09/2021	FSD	Fabric searching Delay	Lay	9:00	9:10	10	4	40
	MD	Machine Delay	Lay	10:10	10:30	20	2	40
	DMD	Decision making Delay	Lay	11:30	11:50	20	4	80
04/09/2021	MB	Marker Delay	Cutting	8:10	8:40	30	2	60
	PF	Power failure	All	9:20	9:23	03	161	483
	FRD	Fabric Relax Delay	Lay	10:00	10:40	40	4	160
05/09/2021	MC	Man power Crisis	Numbering	8:00	8:20	20	1	20
	FD	Fabric Delay	Lay	9:20	9:50	30	4	120
	RD	Recut Delay	Bundling	11:10	11:25	15	2	30
06/09/2021	LD	Lay Delay	Lay	8:00	8:35	35	4	140
	MD	Marker Delay	Cutting	9:10	9:40	30	1	30
	SP	Supervision Problem	Lay	12:00	12:20	20	4	80
07/09/2021	EM	Embroidery Delay	Bundling	9:00	9:30	30	2	60
	PF	Power failure	All	11:00	11:05	05	161	805
	LD	Lay Delay	Lay	12:00	12:30	30	4	120



Table 3.2.1 shows one week non productive time. This cutting done Texeurop BD Ltd. 1st week it has been found some NPT problem. I found maximum NPT in 1st day (1240) and minimum NPT in 3rd day (160). It has been observed 8 hours and number of worker 12 then Calculate total available min = Number of working hour \times Number of worker = $(8 \times 60 \times 12) = 5760$. 1st Day It has been found fabric delay, Lay delay, Cutting delay in lay process in cutting section affected worker (12,4,4) and NTP 90,20,20 minute then Calculate Total NTP = affected Worker \times NPT = $(12 \times 90) = 1080, (4 \times 20) = 80, (4 \times 20) = 80$. Calculate total produce min = Total available min - Total NTP = $(5760 - 1240) = 4520$. 2nd Day it has been found Total available min $(8 \times 60 \times 12) = 5760$, Total NTP $(60 + 15 + 322) = 397$ and Total produce min $(5760 - 397) = 5363$. 3rd Day total available min $(8 \times 60 \times 13) = 6240$ because of 13 worker, Ntp $(40 + 40 + 80) = 160$ and total produce minute $(6240 - 160) = 6080$. 4th Day it has been found total available min $(8 \times 60 \times 12) = 5760$, total ntp $(60 + 483 + 160) = 703$ and total produce minute $(5760 - 703) = 5057$. 5th Day it has been found total available min $(8 \times 60 \times 12) = 5760$, total ntp $(20 + 120 + 30) = 170$ and total produce min $(5760 - 170) = 5590$. 6th days it has been found total available minute $(8 \times 60 \times 12) = 5760$, total ntp $(140 + 30 + 80) = 250$ and total produce minute $(5760 - 250) = 5510$. 7th days total produce minute $(8 \times 60 \times 12) = 5760$, total ntp $(60 + 805 + 120) = 985$ and total produce minute $(5760 - 985) = 4775$.

3.3 Non-Productive Time (NPT) for Cutting Section (Week 2)

Table 3.3.1 Non-Productive Time (NPT) for Cutting Section (Week 2)

Working hour: 08

No of worker: 12

Date	Cause (Code)	Details	Process	Time Start	Time End	NPT in Min	Affected worker	Total NPT (affected Worker × NPT)
08/09/2021	FSD	Fabric Searching Delay	Lay	8:10	8:25	15	4	60
	CD	Cutting Delay	Lay	9:00	9:20	20	4	80
	ED	Embroidery delay	Bundling	12:00	12:35	35	2	70
09/09/2021	PF	Power failure	All	8:00	8:02	02	161	322
	LD	Lay Delay	Lay	8:30	8:45	15	4	60
	MD	Marker Delay	Cutting	12:05	12:25	20	2	40
10/09/2021	FRD	Fabric Relax Delay	Lay	8:00	8:15	15	4	60
	MD	Machine Breakdown	Cutting	11:15	11:40	25	2	50
	RD	Re-cut Delay	Bundling	12:00	12:10	10	2	20
11/09/2021	MD	Machine Delay	Lay	9:30	9:55	20	2	40
	FD	Fabric Delay	Lay	10:25	11:00	35	12	420
	CD	Cutting Delay	Lay	3:00	3:30	30	4	120
12/09/2021	SP	Supervision problem	Lay	10:00	10:15	15	4	60
	MD	Marker Delay	Cutting	11:00	11:20	15	2	30
	PM	Print Mistake	Bundling	12:00	12:25	25	2	50
13/09/2021	MD	Marker Delay	Cutting	10:00	10:07	7	2	14
	PM	Print Mistake	Bundling	11:10	11:30	20	2	40
	Em	Embroidery mistake	Bundling	12:00	12:25	25	2	50



14/09/ 2021	FRD	Fabric Relax Delay	Lay	8:00	8:15	15	4	60
	LD	Lay Delay	Lay	10:00	10:25	25	4	100
	DMD	Decision Making delay	Bundling	2:00	2:09	9	2	18

Table 3.3.1 shows 2nd week it has been found some NPT problem. I found maximum NPT in 11th day (590) and minimum NPT in 10th day (130). It has been observed 8 hours and number of worker 12 then Calculate total available min = number of working hour × number of worker = (8×60×12) = 5760. 8th Day It has been found total Ntp =affected Worker × NPT =(60+80+70)=210 and total produce min = Total available min –Total NTP (5760-210)=5550.9th Day it has been found Total available min (8×60×12)=5760 ,Total NTP (322+60+40)= 422 and Total produce min (5760-422)= 5338. 10th Day total available min (8×60×12) =5760, Ntp (60+50+20) =130 and total produce minute (5760-130) = 5630. 11th Day it has been found total available min (8×60×12) = 5760, total ntp (50+420+120) =590 and total produce minute (5760-590) =5170. 12th Day it has been found total available min (8×60×12) = 5760, total ntp (50+30+60) =140 and total produce min (5760-140) =5620. 13 days it has been found total available minute (8×60×12) = 5760, total ntp (14+40+50) =104 and total produce minute (5760-104)=5656.14th days total produce minute (8×60×13) = 6240 because number of worker 13 ,total ntp (60+100+18)=178 and total produce minute (6240-178)=6062 .

3.4 Non-Productive Time (NPT) for Cutting Section (Week 3)

Table 3.4.1 Non-Productive Time (NPT) for Cutting Section (Week 3)

		Working hour: 08		No of worker: 12				
Date	Cause (Code)	Details	Processes	Time Start	Time End	NTP in Min	Affected worker	Total NPT (affected Worker × NPT)
15/09/2021	SP	Supervision problem	Lay	9:00	9:20	20	4	80
	PM	Print Mistake	Bundling	2:00	2:15	15	2	30
	ED	Embroidery Delay	Bundling	4:00	4:25	25	2	50
16/09/2021	MD	Machine Breakdown	Cutting	9:00	9:35	35	2	70
	PF	Print Mistake	Bundling	11:07	11:28	21	2	42
17/09/2021	LD	Lay delay	Lay	8:30	8:45	15	4	60
	CD	Cutting Delay	Lay	10:15	10:35	20	4	80
	DMD	Decision making delay	Cutting	12:09	12:21	12	2	24
18/09/2021	PF	Power failure	All	8:10	8:14	4	161	644
	FRD	Fabric Relax delay	Lay	8:37	9:05	28	4	112
19/09/2021	MD	Machine breakdown	Cutting	10:07	10:30	23	2	26
	LD	Lay delay	Lay	12:00	12:25	25	4	100
	RD	Re-cut delay	Bundling	3:04	3:23	19	2	38
20/09/2021	MC	Manpower crisis	Numbering	10:10	10:50	40	1	40
	RD	Re-cut delay	Bundling	3:09	9:27	18	2	36
	ED	Embroidery Delay	Bundling	11:04	11:28	24	2	48
21/09/2021	FSD	Fabric Searching Delay	Lay	8:30	8:50	20	4	80
	CM	Cutting Mistake	Numbering	11:05	11:20	15	2	30



Table 3.4.1 shows this cutting done Texeurop BD Ltd. 3rd week it has been found some NPT problem. I found maximum NPT in 18 day (756) and minimum NPT in 21 day (110). It has been observed 8 hours and number of worker 13 then Calculate total available min = Number of working hour \times Number of worker = $8 \times 60 \times 13 = 6240$. 15 Day It has been found total NPT = affected Worker \times NPT = 160. Calculate total produce min = Total available min – Total NPT = $6240 - 160 = 6080$. 16 Day it has been found total available min 5760, total NPT 112 and Total produce min 5648. 17 Day total available min 6240 because of 13 worker, Ntp 164 and total produce minute 6076. 18 Day it has been found total available min 5760, total ntp 756 and total produce minute 5004. 19 Day it has been found total available min 5760, total ntp 164 and total produce min 5596. 20 days it has been found total available minute 6240, total ntp 124 and total produce minute 5636 .21 days total produce minute 5760, total ntp 110 and total produce minute 5650.

3.5 Non-Productive Time (NPT) for Cutting Section (Week 4)

Table 3.5.1 Non-Productive Time (NPT) for Cutting Section (Week 4)

Working hour: 08

No of worker: 12

Date	Cause (Code)	Detail	Process	Time Start	Time End	NTP in Min	Affected worker	Total NPT (affected Worker × NPT)
22/09/2021	LD	Lay delay	Lay	11:00	11:15	15	4	60
	PF	Power failure	All	12:07	12:15	8	161	1288
	MD	Machine delay	Cutting	2:03	2:25	23	2	46
23/09/2021	FD	Fabric delay	Lay	7:40	9:15	95	12	1140
	CD	Cutting delay	Lay	3:10	3:33	23	4	92
	PF	Power Failure	All	4:07	4:10	3	161	483
24/09/2021	LD	Lay delay	Lay	8:05	8:24	19	4	76
	PF	Embroidery Delay	Bundling	7:00	7:25	25	2	50
	DMD	Decision Making Delay	Lay	10:03	10:25	22	4	88
25/09/2021	MD	Machine breakdown	Cutting	11:10	11:40	30	2	60
	RD	Re-cut delay	Bundling	2:00	2:15	15	2	30
	EM	Embroidery Delay	Bundling	3:04	3:26	22	2	44
26/09/2021	FD	Fabric delay	Lay	7:35	8:50	75	4	300
	MD	Marker delay	Cutting	2:00	2:30	30	2	60
	DMD	Decision making delay	Lay	3:00	3:23	23	4	92
27/09/2021	PF	Power failure	All	7:00	7:03	3	161	483
	CD	Cutting delay	Lay	3:25	3:42	17	4	64
	RD	Re-cut delay	Bundling	4:07	4:15	8	2	16



28/09/ 2021	FD	Fabric Searching delay	Lay	7:10	8:45	95	12	1140
	MD	Marker delay	Cutting	9:45	10:10	25	2	50
	SP	Supervision problem	Lay	12:05	12:20	15	4	60

Table 3.5.1 shows fourth week non productive time in cutting section. I collect NTP data from Texeurop Bd Ltd and worked with them for collecting NTP data. Fabric is cutting buyer requirement. 4th week it has been found some NPT problem. I found maximum NTP in day (1394) and minimum NTP in 26 day (452). It has been observed 8 hours and number of worker 13 then Calculate total available min= Number of working hour × Number of worker = 8×60×13 = 6240. 22 Day It has been found Total NTP =affected Worker × NPT =1394.Calculate total produce min = Total available min –Total NTP = 6240- 1394= 4846. 23 Day t has been found total available min 5760, Total NTP 1232 and total produce min 4528. 24 Day total available 5760, Ntp 214 and total produce minute 5546. 25 Day it has been found total available min 6240, total ntp 134 and total produce minute 6106. 26 Day it has been found total available min 5760, total ntp 452 and total produce min 5308. 27 days it has been found total available minute 6240,Total ntp 567 and total produce minute 5673 .28 days total available minute 5760 ,total ntp 1250 and total produce minute 4510 .



CHAPTER-4

RESULT & DISCUSSION



4.1. Analysis of Non-Productive Time (NPT) - Week 1

Table 4.1.1 Analysis of Non-Productive Time (NPT) - Week 1

External	Internal
There are 10 external. They are Fabric Delay 1080, marker delay 15, power failure 322, machine delay 40, marker delay 60, power failure 483, fabric delay 120, marker delay 30, embroidery delay 60, and power failure 805. Total ntp = 3,015	There are 11 internal. They are lay delay 80, machine breakdown 60, cutting delay 80, fabric searching 40, decision making delay 80, fabric relax delay 160, man power crisis 20, re-cut delay 30, lay delay 140, supervision problem 80. Total ntp = 770
External Process are 3 lay , 3 cutting , 1 bundling , 3 power failure (all)	Internal Process are 8 lay, 1 cutting , 1 numbering , 1 bundling
Maximum external are fabric delay	Maximum Internal are fabric relax delay
Minimum external are marker delay	Minimum external are man power crisis

Cutting section non productive time is the main reason for low production. According to the table external and internal problem found. Internal problem solved by cutting section. Engineer are responsible for record lost time input it NTP sheet and analyzing how much time lost in cutting section. Then they show it management for law production. Ntp sheet used for improving productivity and reduce ntp problem .Week 1 total external ntp 3015 and total internal 770. Record the lost time then found maximum external fabric delay 1080 ntp because fabric not arrived proper time in cutting section. If fabric arrived proper time then worker find it then ntp not produced Minimum internal fabric relax delay. Fabric relax time should be maintain properly because not maintain this show shrinkage problem. This used in knit garments. In TEXEUROP BD ltd fabric relaxing time maintain 12 hour. Single jersey fabric relax time 24 hours .The time varied from fabric to fabric .Minimum external are marker delay. In cad section making marker then it send to the cutting section. During marker making specific style and pattern should be accurate. It save the production cost and time.so marker should come accurate time. Minimum external are man power crisis. Operator or helper absent or leave that's the reason of man power crisis.

4.2 Analysis of Non-Productive Time (NPT) - Week 2

Table 4.2.1 Analysis of Non-Productive Time (NPT) - Week 2

External	Internal
There are 10 external. They are Embroidery delay 70, marker delay 40, power failure 322, machine delay 40, fabric delay 420, marker delay 30, print mistake 50, Marker Delay 14, print mistake 40, Embroidery Delay 50 .Total ntp = 1,076.	There are 11 internal. They are fabric searching delay 60, cutting delay 80, lay delay 60, decision making delay 18, fabric relax delay 60, machine delay 50, recut delay 20, cutting delay 120, fabric supervision problem 60, Relax Delay 60, lay delay 100. Total ntp = 688
Maximum external are Fabric Delay	Maximum Internal are Cutting Delay
Minimum external are Marker delay	Minimum internal are Decision making delay
External process are 3 lay , 3 bundle , 1 power failure (all) , 3 cutting	Internal process are 8 lay , 2 bundle , 1 cutting

Cutting section non productive time is main reason for low production. According to the table external and internal problem found. Internal problem solved by cutting section. Engineer are responsible for record lost time input it NTP sheet and analyzing how much time lost in cutting section. Then they show it management for low production. Ntp sheet used for improving productivity and reduce ntp problem. Week 2 it has been found 10 external non productive time 1076 and internal non productive time 688. Maximum external are fabric delay (420). Fabric not arrived proper time in cutting section. If fabric arrived proper time then worker find it then ntp not produced. Minimum internal are found decision making delay when management take late decision to solve the problem as like lay, bundling, numbering. Maximum Internal are Cutting Delay because delay in cutting, less cutting capacity. Minimum external are Marker delay. Marker making specific style and pattern should be accurate. It save the production cost and time. so marker should come accurate time.

4.3 Analysis of Non-Productive Time (NPT) - Week 3

Table 4.3.1 Analysis of Non-Productive Time (NPT) - Week 3

External	Internal
There are 5 external. They are embroidery delay 50, print mistake 42, power failure 644, embroidery delay 48, and print mistake 30. Total ntp = 814	There are 13 internal. They are supervision problem 80, machine breakdown 70, lay delay 60, cutting delay 80, decision making delay 24, fabric relax delay 112, machine breakdown 26, lay delay 100, re-cut delay 38, man power crisis 40, re-cut delay 36, fabric searching delay 80, cutting mistake 30. Total ntp = 776
Maximum external are Power Failure	Maximum Internal are Fabric relax delay
Minimum external are Print Mistake	Minimum external are Decision Making Delay
External process are 4 bundling	Internal process are 6 lay, 3 cutting, 2 numbering , 2 bundling

Industrial Engineer are responsible for record lost time, input it NTP sheet and analyzing how much time lost in cutting section. Then they show it management for low production. Ntp sheet used for improving productivity and reduce cost of production. Week 3 it has been found 5 external problem and 13 internal problem. Maximum external are Power Failure because power failure or loss of electricity. IN cutting section found lay problem but management take decision lately. Minimum external are print mistake happen print placement not done properly .Problem like print size serial mistake, word missing, position, color. Maximum Internal are fabric relax delay. Suppose in knit garment factory fabric relax start time 10am to end time 10pm but cut without relaxation then it show shrinkage problem. Some fabric relax time 12/24 hours .single jersey relax time 24 hours.so maintain fabric relaxation time.



4.4 Analysis of Non-Productive Time (NPT) - Week 4

Table 4.4.1 Analysis of Non-Productive Time (NPT) - Week 4

External	Internal
There are 9 external. They are power failure 1288, machine delay 46, fabric delay 1140, power failure 483, embroidery delay 50, power failure 483, embroidery delay 44, fabric delay 300, and marker delay 60. Total ntp = 3894	There are 12 internal. They are lay delay 60, cutting delay 92, lay delay 76, decision making delay 88, machine breakdown 60, re-cut delay 30, decision making delay 92, cutting delay 64, re-cut delay 16, fabric searching delay 1140, marker delay 50, and supervision problem 60. Total ntp = 1828
Maximum external are Power failure	Maximum Internal are Fabric Searching delay
Minimum external are Machine delay	Minimum external are Re-cut Delay
External process 2 lay, 3 power failure (all) ,2 cutting , 2 bundling,	Internal process 8 lay,2 cutting , 2 bundling

Week 4 it has been found 9 external and 12 internal problem. Record the lost time and analyze standard loss time. 4th week total external NTP found 3,894 and internal total ntp found 1828. I observed 8 hours to collect non productive time .1st find the non-productive time then input it ntp sheet and measure the affected worker then find out total ntp. Maximum external are power failure happen loss of electricity. All worker sit idle, machine stoppage and ntp produced. Minimum external are Re-cut Delay. Again cut the body because of hole, patta, line bar, oil spot, reject body problem. Re-cut delay take more in critical product and less time in basic product. Maximum Internal are Fabric Searching delay. Helper or operator lately find the fabric that's the fabric searching delay. Machine delay when production stop due to machine problem or need to replace the machine. Cutting section non productive time is main reason for low production



4.5 One month Non Productive Time (NPT) Summary:

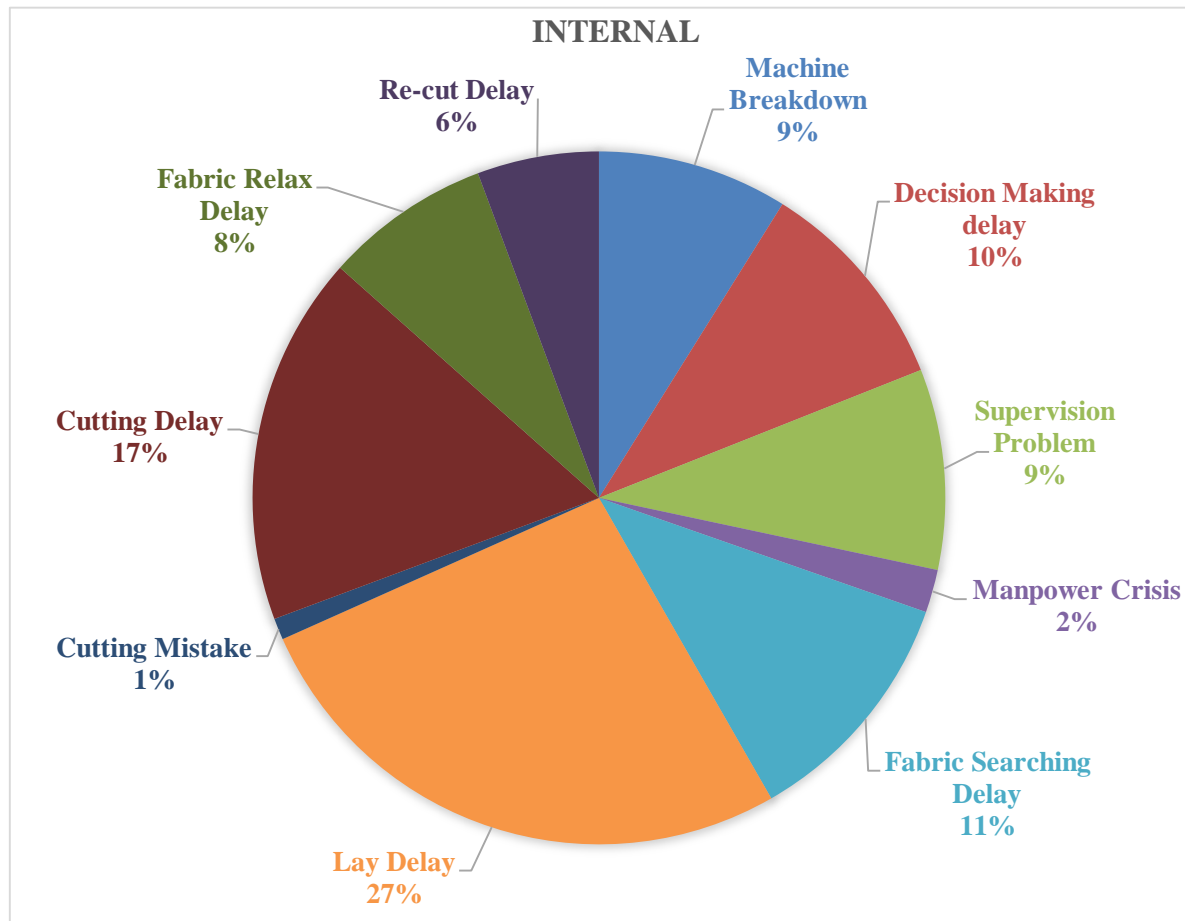
Table 4.5.1 One month Non Productive Time (NTP) Summary

Problem Name	Cause(Code)	NPT(min)
FABRIC DELAY	FD	3060
LAY DELAY	LD	796
CUTTING DELAY	CD	516
M/C BREAKDOWN	MB	266
MARKER DELAY	MD	299
FABRIC SEARCHING DELAY	FSD	340
MACHINE DELAY	MD	126
DECISION MAKING DELAY	DMD	302
FABRIC RELAX DELAY	FRD	232
MAN POWER CRISIS	MC	60
RECUT DELAY	RD	170
LAY DELAY	LD	796
PRINT MISTAKE	PM	162
SUPERVISION PROBLEM	SP	280
EMBROIDERY DELAY	ED	322
POWER FAILURE	PF	4830
Total		12557

Here I showing one month Non productive time (NTP) in cutting section and problem are same but npt are different. Maximum npt are power delay and minimum machine delay failure happen loss of electricity. All worker sit idle, machine stoppage and npt produced. Machine delay when production stop due to machine problem or need to replace the machine.

4.6 Total Internal graph:-

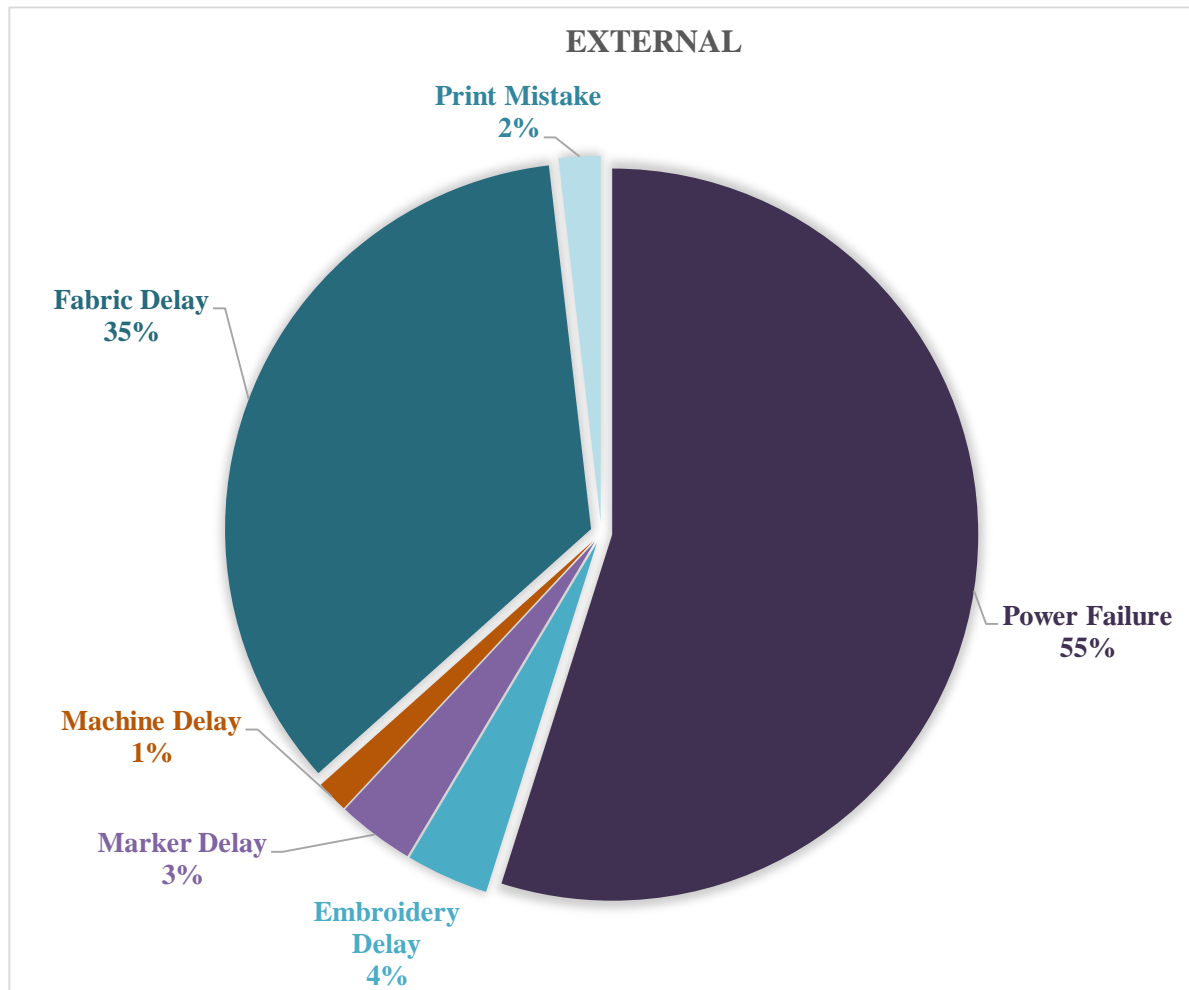
Figure 4.6.1 Total Internal graph



Monthly cutting internal problem in Texeurop Bd Ltd. I have found that maximum Lay delay and minimum man power crisis. Also found some internal problem with percentage. They are machine delay 9%, decision making delay 10%, supervision problem 9%, man power crisis 2%, fabric searching delay 11%, lay delay 27%, cutting mistake 1%, cutting delay 17%, fabric relax delay 8%, re-cut delay 6%.

4.6.1 Total External graph:-

Figure 4.6.1.1 Total External graph



Monthly external problem in Texeurop Bd Ltd. I have found that maximum power failure and minimum print mistake. also found external with percentage. They are power failure 55%, embroidery delay 4%, marker delay 3%, machine delay 1%, fabric delay 35% and print mistake 2%.



CHAPTER-5

CONCLUSION



Conclusion

This thesis report shows non productive time (NPT) in cutting section and found different type of problem. The major problem of Non productive time is low production. If work properly on NTP then achieve proper production and minimize higher cost of production.

This thesis paper is concluded as:-

- Monthly maximum external are power failure and minimum internal are man power crisis because loss of electricity and operator absent.
- Monthly maximum internal are lay delay and minimum external are machine delay because of fabric not arrived and machine problem.
- External monthly process 8 lay ,10 bundle ,7 power failure (all) ,8 cutting for those 2,992 min time wasted
- Internal monthly process are 30 lay ,7 bundle , 7 cutting for those 8,799 min time wasted



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