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WORKLOAD ANALYSIS AND DETERMINATION OF THE OPTIMAL NUMBER OF WORKERS ON THE OPERATOR'S PART WITH THE WORKLOAD ANALYSIS METHOD APPROACH

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Abstract *–This study aims to analyze the workload of operators in the UHT department of PT Indolakto Cicurug 3 and determine the optimal number of workers using the Workload Analysis (WLA) method approach. The population of this study is all operators in the UHT department of PT Indolakto Cicurug 3 which totals 40 people. The research sample was selected using the purposive sampling method, with one representative from each of the five working parts (Tipper, Mixing, Sterilizer, Filling, and Packing), so that the total sample was five people. The data collection method was carried out through direct observation using the Stopwatch Time Study to measure working time, semi-structured interviews with operators and management to understand work activities and challenges faced, as well as analysis of historical data related to productivity and previous work records. The data obtained was analyzed using the Workload Analysis method, which included the calculation of standard time, allowance percentage, and data uniformity and adequacy tests to ensure the validity of the results. The results showed that there was a workload imbalance in some sections, with some stations experiencing overload (>100%), while others had lower loads (<70%). This imbalance has the potential to affect productivity and labor welfare. Based on the results of the Workload Analysis, this study recommends redistribution of labor to achieve a more optimal balance, which is expected to improve operational efficiency and overall labor welfare.*

Keywords: *Workload Analysis, Workload, Optimal Workforce, UHT Operators, Employee Welfare*

INTRODUCTION

In the era of globalization, industrial competition is getting fiercer, demanding companies to improve their operational efficiency and productivity. One of the main factors that contribute to this achievement is the optimization of human resources. In the manufacturing industry environment, especially in the ready-to-drink dairy product processing sector, labor efficiency is a crucial aspect in achieving the production targets that have been set. The researcher made observations at PT Indolakto Cicurug 3 in the UHT department which has parts of work ranging from Tipper, Mixing, Sterilizer, Filling, and Packing. Then with the number of operators is 40 people divided into 4 shifts, as one of the companies in the dairy industry, facing challenges in labor management in the UHT Department with an increase in production capacity from 24,000 pcs/hour to 26,000 pcs/hour, there is a significant increase in operator workload. This has the potential to affect the productivity and welfare of the workforce if not managed properly.

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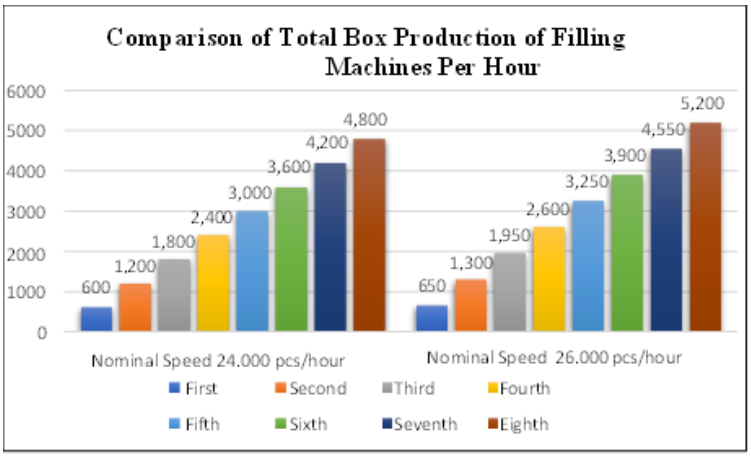

Figure 1. Comparison of total box production of filling machines per hour

Figure 1 for the first graph explains that when the filling machine produces production with a nominal speed of 24,000 pcs/hour, it takes 60 minutes and is calculated for 8 working hours, with the number of units in the box as many as 40 pcs. So the production target produced is 4,800 boxes equivalent to 192,000 pcs, with a total number of operators per shift of 10 people.

Meanwhile, the second graph explains that when the Filling machine produces production with a nominal speed of 26,000 pcs/hour, it takes 60 minutes and is calculated for 8 working hours, with the number of units in the box as many as 40 pcs. So the production target becomes larger, namely 5200 boxes equivalent to 208,000 pcs with a total number of operators per shift of 10 people. It can be seen that the comparison of the number of targets produced, of course, will also affect the workload and effectiveness of production operators.

1. Tipper

a) Activity 1: Raw material pouring (60 minutes)
24,000 pcs/hour = 5 repetitions of work activities.
26,000 pcs/hour = 6 repetitions of work activities.

b) Activity 2: Cleaning the silo area after pouring (15 minutes)

24,000 pcs/hour = 5 repetitions of work activities.

26,000 pcs/hour = 6 repetitions of work activities.

2. Mixing

a) Activity 1: Stabilizer pouring and dairy product making (60 minutes)

24,000 pcs/hour = 4 repetitions of work activities.

26,000 pcs/hour = 5 repetitions of work activities.

b) Activity 2: Product withdrawal and pouring of minor raw materials (60 minutes)

24,000 pcs/hour = 4 repetitions of work activities.

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26,000 pcs/hour = 5 repetitions of work activities.

3. Sterilizer

a) Activity 1: Sterilized product withdrawal (75 minutes)
24,000 pcs/hour = 5 repetitions of work activities.

26,000 pcs/hour = 6 repetitions of work activities.

b) Activity 2: Checking products in the holding tank (10 minutes), adding work activities after the change of capacity.

4. Filling

a) Activity 1: Paper installation (15 minutes)

24,000 pcs/hour = 8 repetitions of work activities.

26,000 pcs/hour = 9 repetitions of work activities.

b) Activity 2: Strip installation (4 minutes)

24,000 pcs/hour = 7 repetitions of work activities.

26000 pcs/hour = 8 repetitions of working activities.

c) Activity 3: Sampling and pack integrity check (4 minutes)

24,000 pcs/hour = 20 repetitions of work activities.

26,000 pcs/hour = 22 repetitions of work activities.

5. Packing

a) Activity 1: Paper sampling (3 minutes)

24,000 pcs/hour = 21 repetitions of work activities.

26,000 pcs/hour = 24 repetitions of work activities.

b) Activity 2: Strip sampling (3 minutes)

24,000 pcs/hour = 18 repetitions of work activities.

26,000 pcs/hour = 21 repetitions of work activities.

The increase in machine speed from 24,000 pcs/hour to 26,000 pcs/hour has a direct impact on the number of work activities that must be carried out by the operator at each stage of production with a fixed number of operators, this increase causes the working frequency to increase so that the individual workload increases in the same time period. If not managed properly, this can lead to burnout, decrease efficiency, and increase the risk of work errors. Although production has increased, long-term effectiveness can decrease if employee welfare is not considered.

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Unbalanced workloads, both overload and underload, can have a variety of negative impacts. Overload can lead to physical and mental fatigue, stress, and a decrease in work quality. On the other hand, underloading can result in boredom and reduced work motivation. This imbalance ultimately affects the company's operational efficiency and business sustainability.

To overcome this problem, an analysis method is needed that can objectively evaluate the distribution of workloads. Workload Analysis (WLA) is a relevant approach in determining the optimal amount of labor based on the actual workload received by operators. With this method, companies can get a more accurate picture of labor needs and workload redistribution strategies to improve employee welfare and production efficiency.

This study aims to analyze the workload of operators in the UHT Department of PT Indolakto Cicurug 3, identify the impact of workload imbalance on labor welfare, and determine the optimal number of workers. The results of this research are expected to contribute to companies in developing more effective human resource management strategies, in order to create a productive and sustainable work environment.

LITERATURE REVIEW

1. Human Resource Management

Human resource management (HRM) is an important element in an organization to ensure optimal achievement of goals. Not only administrative management, MSDM also plays a role as a strategic partner in supporting the improvement of organizational performance. In the modern era dominated by globalization and digitalization, responsive and innovative human resource management is a requirement for organizations to be able to survive in the midst of increasingly competitive business competition. (Dessler, 2020)

2. Operational Management

Operational management is a branch of management science related to planning, organizing, controlling, and supervising production and operational processes in an organization. According to Heizer and Render (2020), operational management includes various activities aimed at creating value through processing inputs into outputs that have added value.

3. Workforce

Proper workforce planning based on workload has an effect on maintaining work optimization and increasing labor productivity. Alignment between workload and worker skills is essential to increase company productivity. If workers experience excessive mental and physical workload, energy recovery becomes indispensable. (Irawan & Leksono, 2020)

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METHODS

1. Research Design

The design of this study uses descriptive research. According to , descriptive analysis is a statistic used to analyze data by describing or presenting the collected data as it is, without any intention to draw conclusions or general concepts. The generalization of the data processing or analysis techniques used is qualitative data techniques. The results of data processing are presented in the form of tables or the results of analysis are presented using qualitative descriptive techniques. Sugiyono (2022)

2. Variable Definition

a. Independent Variable
The independent variable is the variable that affects or causes the emergence of the bound variable (production operator labor).

b. Dependent Variable
The bound variable is the impact caused by the independent variable (Workload).

1) Calculating the Percentage of Productivity

According to , explained that the calculation of the production percentage is carried out to find out several percent of the operator's performance level in carrying out the work process. Maulana & Putra (2022)

$$P = \frac{\text{Task duration}}{\text{The total productive time (minutes)}} \text{ x } 100\%$$

2) Calculating Allowance Percentage

According to , allocation is often used to describe appropriate measures related to the level of standards and time, including the ability to complete responsibilities or tasks that have been learned. Fatigue allowance is seen as an ideal opportunity for workers to meet their personal needs, while late payment allowance is an unavoidable allowance because it is under the control of the operator. Suroso & Yulvito (2020)

Allowances granted include:

1) Fatigue Allowance : Given to take into account the physical or mental fatigue of workers due to work activities. Fatigue can be caused by various factors such as work posture, physical intensity, or length of work.
2) Unavoidable Delay Allowance : Given to account for unavoidable delays, such as waiting for instructions, equipment, or handling minor interruptions at work.
3) Personal Needs Allowance : Given for the worker's personal needs, such as time to go to the toilet, drink, or take a short break.

Standard Allowance Category based on Time Study Method (Sutalaksana et al., 2006)

3) Performance Level

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Performance rating It can be calculated by using the Westinghouse table with 4 factors to consider in evaluating worker productivity, namely: skill, effort, condition, and consistency, with the formula Rating Westinghouse, source: Niebels, 1999.

4) Calculating Proportional Cycle Time

According to , Proportional Time is where the time required by the operator of each workstation to perform each job description. To find out the proportional cycle time can be calculated by the formula: Arifin (2020)

Proportional Cycle Time = Cycle Time X Percentage Productive Operator Workers

5) Calculating Normal Time

According to , normal time is the time that has taken into account adjustment factors, namely proportional cycle time multiplied by the performance rating factor, from these results the normal time of each work station is obtained, with the following formula: Arifin (2020) (Sutalaksana et al., 2006)

Normal Time = Proportional Cycle Time X (1 + Performance Rating)

6) Calculating Standard Time

According to , Standard Time is the actual time that it takes the operator to complete the work by taking into account the allowance or fatigue factor, which can be calculated by the formula: Asarela & Sari (2023) (Sutalaksana et al., 2006)

Standard Time = Normal Time X Allowance

7) Calculating the Workload

According to , workload analysis is the effort that a person must spend to meet the requirements of a job, while capacity is the ability or capacity of human resources, this capacity can be measured through a person's physical and mental condition. Workload refers to the size (portion) of the limited capacity of the operator needed to perform a particular job. The formula is: Maulana & Putra (2022) (Sutalaksana et al., 2006)

$$\frac{\text{Total standard time}}{\text{Total Work time}} \text{ x } 100\%$$

8) Calculating the Optimal Operator

Calculating the optimal operator is to determine the right number of operators to achieve the company's goals with maximum efficiency then the balance between labor needs and the company's capabilities, the benefits increase efficiency, increase productivity, improve work quality, and optimize human resources, with the formula: (Arifin, 2020)

$$\text{Average proposal} = \frac{\text{Total workload}}{\text{Total employees needed}}$$

3. Research Population and Sample

a. Population, the entire object or individual that is the focus of a study.
The population is the operator of the UHT department PT Indolakto Cicurug 3
b. Samples, a portion of the population taken to represent the entire population in the study.

The sample is Purposive Sampling , there are 5 sections with a total of 40 employees in 4 shifts. One person in each section is a representative of work activities.

4. Variable Measurement Scale

The measurement of working time used is as much as the measurement of direct working time using a stopwatch time study.

For reference, the workload should be close to 70% - 100%. Labor calculation is carried out, there are 3 possibilities (Pambudi, 2017):

a. Workload measurement < 70%. (Underload)

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If this happens, it means that the number of workers and workload is as large as at the time of over-metering and if necessary will be reduced to balance the workload and labor.

b. Workload at measurement time 70% - 100% (Fit)
If this happens, the number of workers and workload at the time of measurement is good, meaning the number of workers working in accordance with the needs of the workload.

c. Workload at the time of measurement > 100% (Overload)
This indicates that the number of workers and workload at the time of measurement is higher than usual, meaning that there must be additional manpower.

5. Data Analysis Methods

In this study, the author uses the Workload Analysis (WLA) method. WLA is one of the ways used to calculate the amount of workload resulting from the activities carried out. This study will analyze several causes of the large workload that has been received by operators and can also determine the optimal number of workers for the company.(Wibawa et al., 2017)
Then conduct an instrument test,

a. Data Uniformity Test
The Uniformity Test of this test data is carried out to determine whether the data obtained is uniform and does not exceed the upper control limit (BKA) and lower control limit (BKB) that have been set or not. If the data is inconsistent, it will be deleted. The formula for determining the control limit is:

1) Determine the amount of data obtained from data collection in the field or called $\bar{X}$, with the formula: Sutalaksana et al., 2006)
$\bar{X} = \sum \frac{Xi}{n}$

2) Standard deviation is a statistical measure that shows how much variation or deviation the data is, to calculate the standard deviation from the actual time is: (Sutalaksana et al., 2006)

$$\delta = \sqrt{\frac{\sum(Xi-\bar{X})\,2}{n-1}}$$

3) Finding the upper control boundary and the lower control boundary, the goal is to test the uniformity of the data distribution, identify significant differences between data groups, with the formula: Arifin (2020) (Sutalaksana et al., 2006)
Upper control limit = $\bar{X}$ + (3xσ)
Lower control limit = $\bar{X}$ - (3xσ)

Information:
BKA = Upper Control Limit
BKB = Lower Control Limit
n = Number of observations
δ = Standard deviation
$\bar{X}$ = Average sum of each working element

b. Data Adequacy Test
The data adequacy test was carried out to determine whether the amount of observation data was sufficient to complete the research. The number of observations completed on the work sample will be influenced by two variables, namely the level of accuracy and the level of trust, with the following formula: (Sutalaksana et al., 2006)

$$N' = \left[\frac{\frac{k}{s}\sqrt{N(\Sigma Xi^2)-(\Sigma Xi)^2}}{\Sigma Xi}\right]^2$$

$$S = x\ 100\%\frac{s}{\bar{X}}$$

$$K = 100\% - S$$

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Where:
N'= Number of observations to be made for work sampling
N = Number of observations that have been made for work sampling
ΣXi = Total amount of data accumulation
S = Coefficient of accuracy
k = The price of the index whose magnitude depends on the level of confidence taken, i.e.

- For a 68% Trust Level, k = 1
- For 95% Confidence Level, k = 2
- For 99% Confidence Level, k = 3

Where the determination of data adequacy is as follows:
If N = N' then the Number of Observations made is declared sufficient.

If N < N' then the number of observations made is declared insufficient

The results of the research on 4 Tipper, Sterilizer, Filling, and Packing workstations, with the initial suspicion of an increase in the speed of the filling machine from 24,000 pcs/hour to 26,000 pcs/hour, there was an increase in the frequency of work activities in operators in various parts:

1) Tipper: Raw material pouring increased from 5 times to 6 times per working cycle and silo area cleaning after pouring from 5 times to 6 times.
2) Mixing: Stabilizer pouring and dairy product manufacturing increased from 4 times to 5 times per working cycle, as well as product withdrawal and minor raw material pouring from 4 times to 5 times per working cycle.
3) Sterilizer: The recall of sterilized products has increased from 5 times to 6 times per work cycle as well as the addition of product checking in the holding tank.
4) Filling: Paper installation increased from 8 times to 9 times per work cycle and pack integrity check increased from 20 times to 22 times.
5) Packing: Paper sampling increased from 21 to 24 times and strip sampling increased from 18 times to 21 times per work cycle.

This workload imbalance indicates that at the Sterilizer workstation, the operator is overloaded due to the increase in job descriptions, namely checking products in the holding tank. In addition, multiple tasks are performed simultaneously, which requires the operator to work multitasking in high-pressure conditions. This overload can lead to increased fatigue, work errors, and decreased productivity in the long run. On the other hand, Packing workstations are underloaded because most job descriptions have a short completion time and the Packing machine runs smoothly, so that operators rarely intervene to repair the machine. This condition can lead to demotivation and reduced productivity due to the lack of adequate work challenges.

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RESULTS AND DISCUSSIONS

1. Percentage Results

From the results of the research in a week (5 working days), the data obtained is as follows:
Operator Tipper

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Table 1 Tipper Job Description

Number	Job Description	Total Processing Time (Minutes)	Productive Percentage
1.	Preparation for work	50	2,08 %
2.	Dor at the beginning of work	50	2,08%
3.	Check the condition of silos and areas	35	1,46%
4.	RM Pouring Strawberry Material	85	3,54%
5.	RM Pouring Chocolate Material	120	5,00%
6.	Cleaning silo	75	3,13%
7.	Sulurry Chocolate Pouring	80	3,33%
8.	Double Palet	150	6,25%
9.	RM Preparation	450	18,75%
10.	Cleaning the area	150	6,25%
11.	Cleaning the PSA	30	1,25%
12.	Report Creation	50	2,08%
Total		**1.325**	**55,20%**
		2.400	**100,00%**

2. Uniformity Test

Operator Tipper

Table 2 Tipper Data Uniformity Test

No	Xi	(Ha-x̄)	$(Xi - \bar{x})^2$	Xi^2
1.	50	-60,42	3.645,50	2.500
2.	50	-60,42	3.645,50	2.500
3.	35	-75,42	5.689,16	1.225
4.	85	-25,42	646,36	7.225
5.	120	9,58	91,79	14.400
6.	75	-35,42	1.254,64	5.625
7.	80	-30,42	924,64	6.400
8.	150	39,58	1.566,66	22.500
9.	450	339,58	115.315,30	202.500
10.	150	39,58	1.566,66	22.500
11.	30	-80,42	6.466,16	900
12.	50	-60,42	3.645,50	2.500
Total	**ΣXi = 1.325**	**Σ(Ha-x̄) = -0.04**	**$\Sigma(Xi - \bar{x})^2$ = 144.457,9**	**ΣXi^2= 290.775**

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a. Determine the total amount of overall data results:
$\bar{X} = \sum = \frac{Xi}{n}$ (Sutalaksana et al., 2006)

$= \frac{1.325}{12}$

= 110.42 minutes

b. Calculating the standard deviation is known,

$\sum(Xi - \bar{X})^2 = 144,457.9$

n = 12

$\delta = \sqrt{\frac{\sum(Xi-\bar{X})\,2}{n-1}}$

$= \sqrt{\frac{144.457,9}{12-1}}$

= 114.59 minutes

So the standard deviation of Tipper is 114.59 minutes

c. Upper Control Limit and Lower Control Limit

Upper control limit = $\bar{X}$ + (3xσ)

= 110,42 + (3 x 111,09)

= 443.69 minutes

Lower control limit = $\bar{X}$ - (3xσ)

= 110,42 – (3 x 111,09)

= -222.85 minutes

Table 3 Tipper Uniformity Description

No	Xi	(Ha-x̄)	$(Xi - \bar{x})^2$	Xi^2	Information
1.	50	-60,42	3.645,50	2.500	**Uniform**
2.	50	-60,42	3.645,50	2.500	**Uniform**
3.	35	-75,42	5.689,16	1.225	**Uniform**
4.	85	-25,42	646,36	7.225	**Uniform**
5.	120	9,58	91,79	14.400	**Uniform**

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6.	75	-35,42	1.254,64	5.625	**Uniform**
7.	80	-30,42	924,64	6.400	**Uniform**
8.	150	39,58	1.566,66	22.500	**Uniform**
9.	450	339,58	115.315,30	202.500	**Uniform**
10.	150	39,58	1.566,66	22.500	**Uniform**
11.	30	-80,42	6.466,16	900	**Uniform**
12.	50	-60,42	3.645,50	2.500	**Uniform**
Total	**ΣXi = 1.325**	**Σ(Ha-x̄) = -0.04**	**$\Sigma(Xi - \bar{x})^2$ = 144.457,9**	**ΣXi^2= 290.775**	

Analysis: All total task descriptions are within the upper control limit and the lower control limit, so that the data is controlled.

3. Adequacy Test

The level of confidence refers to the extent of confidence in the accuracy of the measuring tools used in the study in this study using a 99% confidence level with a value of K=3. Meanwhile, the level of rigor refers to the tolerance for maximum deviation from the actual result. The data is considered sufficient if it meets the condition of N'< N. However, if N' is greater than N, then the existing data needs to be added and retested. (Arifin, 2020) .

Tipper data adequacy test

$$N' = \left[\frac{\frac{k}{s}\sqrt{N(\Sigma Xi^2)-(\Sigma Xi)^2}}{\Sigma Xi}\right]^2$$

$$= \left[\frac{\frac{3}{3,4}\sqrt{12(290.775)-(1.325)^2}}{1.325}\right]^2$$

N’ = 8,3 N = 12

8,3 < 12

N' < N, so that the data on the measurement of Tipper's working time is sufficient

4. Persentase Allowance

From the description of productivity, there is an adjustment of allowance given to operators for one week (5 working days) based on influencing factors,

A = Energy expended
B = Work attitude
C = Working motion
D = Eye fatigue
E = Temperature state
F = Atmospheric state
G = Environmental state, with the following values:

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Table 4 Results of Relaxation Factors

No	Workstation	Relaxation Factor							Total Allowance (%)
		A	B	C	D	And	F	G	
1.	Tipper	21%	1,5%	0%	0%	0%	0%	0%	**22,5%**
2.	Mixing	11,5%	1%	0%	4%	0%	0%	0%	**16,5%**
3.	Sterilizer	10,5%	1%	0%	4%	0%	0%	3%	**18,5%**
4.	Filling	8,5%	2%	0%	2%	5%	0%	1%	**18,5%**
5.	Packing	7,5%	2%	0%	2%	5%	5%	1%	**22,5%**

5. Performance Rating

To find out everyone's workload, it is necessary to know how to evaluate performance. The calculation of the performance index (which is adjusted) can be done by adding up the factors that affect a person's performance and given an added value of 1, this value of 1 is a person's tendency to work according to standards. The data can be presented as follows:

Table 5 Performance Rating Results

No	Workstation	Factor				Total Performance Rating
		Skills	Effort	Working Conditions	Consistency	
1.	Tipper	0,15	0,05	0,00	0,04	**1,24**
2.	Mixing	0,13	0,10	0,00	0,04	**1,27**
3.	Sterilizer	0,13	0,10	0,00	0,04	**1,27**
4.	Filling	0,15	0,10	0,00	0,04	**1,27**
5.	Packing	0,13	0,08	0,00	0,03	**1,24**

6. Calculating Proportional Cycle Time, Normal Time, and Standard Time

It shows that the proportion of real time on each workstation by accumulating the total cycle time on each task description in 5 working days, is outlined as follows:

Tipper

Table 6 Calculation of Proportional Cycle Time, Normal Time and Standard Time

No	Job Description	Time (Minutes)	Proportional Cycle Time (%)	Normal Time	Standard Time
1	Preparation for work	50	2,08	62,00	13,95
2	Dor at the beginning of work	50	2,08	62,00	13,95
3	Check the condition	35	1,46	43,40	9,77

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	of silos and areas				
4	RM Pouring Strawberry Material	85	3,54	105,40	23,72
5	RM Pouring Chocolate Material	120	5,00	148,80	33,48
6	Cleaning silo	75	3,13	93,00	20,93
7	Sulurry Chocolate Pouring	80	3,33	99,20	22,32
8	Double Puck	150	6,25	186,00	41,85
9	RM Preparation	450	18,75	558,00	125,55
10	Cleaning the area	150	6,25	186,00	41,85
11	Cleaning the PSA	30	1,25	37,20	8,37
12	Report Creation	50	2,08	62,00	13,95
Total		**1.325**	**55,20%**	**1.643,00**	**369,68**

7. Workload Analysis

From the previous calculations, it can be known that the workload of each work sector, the data is as follows:

Table 7 Accumulated Values

No	Workstation	Productive Percentage (%)	Performance Rating (P)	Allowance (%)	Workload (%)	Category
1.	Tipper	55,20%	1,24	25,5%	77,01%	**Fit**
2.	Mixing	75,62%	1,27	16,5%	79,23%	**Fit**
3.	Sterilizer	87,54%	1,27	12,5%	102,83%	**Overload**
4.	Filling	83,14%	1,27	18,5%	98,72%	**Fit**
5.	Packing	41,08%	1,24	22,5%	58,70%	**Underload**

8. Calculating the Optimal Operator

Total workloads in positions overload namely the part of workers as Sterilizer operators with a total workload of 102.83% which means that this needs to be studied again and can be formulated as follows:

Average workload (real conditions) = 102.83% per person in one group.

Average workload (Proposed) = = 51,41%$\frac{102,83\%}{2}$

From the results of the study, it is better to add the number of operators in the sterilizer section plus 1 person in a group with an average workload of 51.41%.

So, after conducting research using the Stopwatch Time Study measurement method , it was obtained that the number of Tipper data had a value of 77.01%, Mixing with a value of 79.23% and Filling of 95.72% as a result of processing workload data received in accordance with the standard or Fit, then Sterilizer 102.83% exceeded the standard workload or overload This of course requires an

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additional operator to optimize the workload for the last Packing data of 58.70, whose workload needs to be re-evaluated to meet the workload standards.

CONCLUSION

The following conclusions obtained from the results of the research in accordance with the research objectives include the following:

1. Based on the results of the analysis of workload data in the UHT department of PT Indolakto Cicurug 3, with the optimal category range (70%-100%) of the workload value Tipper 77.01% (Fit), Mixing 79.23% (Fit), Sterilizer 102.83% (Overload), Filling 98.72% (Fit), and Packing 58.70% (Underload). The results of the workload analysis show that the Tipper, Mixing, and Filling workstations are in the fit category, so they do not require additional labor (it is optimal). However, the Sterilizer station is overloaded, it is necessary to add one operator in each group to maintain the workload balance and prevent labor fatigue. Meanwhile, the Packing station is classified as underload so that the labor in this part can be distributed to other stations in need.
2. The workload imbalance in the UHT department of PT Indolakto Cicurug 3 has a negative impact on the welfare of employees, both physically and mentally. In the Sterilizer section, which experienced work overload with a workload level of 102.83%, employees faced the risk of physical fatigue, prolonged stress, and decreased productivity due to excessive work pressure. This condition can also trigger high employee resignation. On the other hand, in the Packing section, which experienced underload with a workload level of only 58.70%, employees tended to lose motivation, feel bored, and become less efficient at work. This underload condition can also create a perception of injustice among employees, which can affect the overall work atmosphere. Determining the right number of workers is an important step to mitigate this impact by redistributing labor.
3. The results of the data analysis showed that there was an imbalance in the distribution of workload that affected the determination of the number of workers at PT Indolakto Cicurug 3. At the Sterilizer workstation, which experienced work overload with a workload level of 102.83%, optimization was carried out by adding 1 person per group, so that the workload dropped to 51.41%. Meanwhile, the Packing workstation, which experienced underload work with a workload level of 58.70%, indicated that there was an excess of labor that had the potential to be diverted or optimized to support other busier workstations. With this redistribution, the workload at each station has been better distributed.

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The following suggestions can be given after conducting research at PT Indolakto Cicurug 3 for both the company and readers, which are as follows:

1. The workload on the Sterilizer and Packing workstations has been better distributed, but the ideal workload optimization with a value range of 70–100%, has not been achieved. It is recommended that the workforce at the Packing station be allocated to the Sterilizer workstation, which is by moving 1 person per group. In addition, the Sterilizer workstation, which has been optimized to have a workload level of 51.41%, can be added to other tasks or jobs so that the workload distribution becomes more even. This step is expected to create a balance of performance that contributes to improving employee welfare, while reducing the risk of resignation due to physical and mental exhaustion.
2. Future research is suggested to broaden the scope of the analysis by considering external factors, such as organizational culture and management policies, that can affect employee workload and well-being. Additionally, the use of more in-depth methods, such as interviews or employee satisfaction surveys, can provide more comprehensive data.

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