Journal of Mekintek, 13 (1) (2022) pp. 30-36
Published by:IHSA Institute

Mekintek Journal: Journal of Mechanical, Energy, Industry and Technology
Journal homepage: www.ejournal.isha.or.id/index.php/Mekintek

Analysis of the Implementation of Occupational SafetyPrograms in an Effort to Increase Work Productivity Using a Fault Tree Analysis Approach (Case study: CV. Permata 7, Wonogiri)

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ARTICLEINFO

Article history:

Received Jan 19, 2022
Revised Mar 05, 2022
Accepted Apr 09, 2022

Keywords:

Implementation of Work Safety Programs,
Fault Tree Analysis,
Productivity.

ABSTRACT

CV. Permata 7 Wonogiri in its operation does not escape the problems faced such as work accidents, occupational diseases and the negative impact of industry on the surrounding environment, the level of human work safety as a production factor is very necessary so that optimal productivity can be achieved. The implementation of work safety programs for workers is an important supporting business in production activities. Every work safety program consists of several program elements and their supporters. In this case the author departs from 2 opinions, namely according to: Edwin B. Flippo and the International Labor Organization (ILO). In this study, the measurement of work safety results and the safe T value, the frequency level for stating the number of accidents that occur every 1,000. 000 hours worked in the current period. Severity level states the number of days lost due to accidents due to accidents for every 1,000,000 working hours of the number of "hours worked" employees. The safety T value is a measurement that aims to compare the results of the accident reduction rate achieved for the work. From the implementation of the occupational health program on CV. Gem 7 Wonogiri can be said to have done quite well. Accidents that occurred in 2005-2007 were 15, 13, 11 times accidents. With the frequency level from 2005-2007 is 64.9; 49.9; 36.1. the severity that occurred in 2005-2007 was 458.9; 284.2; 233.2. With the T-Score of Congratulations in 2006 it was known – 950.2 and in 2007 it was – 1078.2.

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1. INTRODUCTION

An activity in the production process in the company, humans play a very important role in addition to the machine factor and raw materials. So humans as employees need to be maintained, the effort to retain these employees is not only about the problem of preventing the loss of these employees but also to maintain the attitude of cooperation and work ability of these employees.

Safety and health programs, for example, will help to maintain their physical condition, while employee service programs in various forms maintain the attitude of employees. Therefore, to keep what has been achieved and produced during this development intact and safe and to keep the production process running safely, smoothly and efficiently, it is necessary to increase programs in the field of occupational health and safety.

CV. Permata 7 in its operation does not escape the problems it faces, such as the waste disposal area around the machine which is very disturbing in the production process which can lead to fatal accidents. Then the amount of ventilation is not enough, so that employees feel uncomfortable at work, feel hot and not enthusiastic. to carry out their activities. Insufficient lighting results in workers' eyes not being able to see clearly during the cutting process and result in the worker's finger being hit by the cutting knife. Large-scale noise, especially wood splitting machines, can cause hearing loss to workers, and only a few workers use personal protective equipment.

The size of the losses suffered depends on the size of the frequency and severity of the accidents that occur. Thus accidents due to work will greatly affect the activities of the production process and the survival of the company or in other words accidents that befall work is one of the factors that affect work productivity.

The relationship between work safety and productivity level is that the greater the accident rate, the lower the productivity level and the smaller the accident rate, the higher the productivity level. The fewer accidents that occur, the smaller the lost workdays and result in higher levels of productivity.

Several health conditions that cause low productivity are occupational diseases, poor nutritional status of the workforce, and a work environment that is less helpful for optimal productivity of the workforce. The relationship between health and productivity is a worker who is sick usually loses productivity significantly, even the level of productivity often becomes zero at all. The state of chronic illness becomes very low productivity for a relatively long time. The situation between being healthy and sick is also a decrease in productivity which can often occur seen in real even big. For high productivity efficiency, work must be carried out in a manner and in an environment that meets health requirements. l Bonding Materials".

2. RESEARCH METHOD

2.1. Object of research

This research was conducted at the company CV. Permata 7 which is located on Jl. Yudhistira I/05 Wonokarto Wonogiri, Wonogiri District, Wonogiri Regency.

2.2. Method of collecting data

In this study, several data collection techniques were used, including:

a. Interview method
   Data collection by means of question and answer which is carried out directly and systematically to several parties including: company owner, head of production, head of sie K3, and employees at CV. Gem 7.
b. Observation method
   Namely the acquisition of data by observing and recording directly on the object under study in the CV. Gem 7 like : available resources, runtime etc.
c. Literature research (secondary data)
   Is research by studying the literature related to existing problems such as: the relationship between the level of work safety and the level of productivity

2.3. Data processing

The steps that must be done are to determine:

a. Work Frequency/Frequency Level
   Frequency level states the number of accidents that occur every million hours of human work with the formula:

$$F = \frac{n \times 1{,}000{,}000}{N}$$ **(Budiono ; 1992)**

□ ISSN 2086-7026 (Print), 2808-7372 (Online)

Where: F = The frequency level of accidents
n = Number of accidents that occur
N = Number of working hours of employees

b. Severity Level or Work Accident Severity
In order to measure the impact of an accident, the severity of the accident must also be calculated for a million hours worked from the number of hours worked by employees

$$S = \frac{H \times 1{,}000{,}000}{N}$$ (Budiono ; 1992)

Where : S = Seferity level/severity of the accident
H = Total number of lost hours of employees
N = Number of working hours of employees

3. RESULTS AND DISCUSSIONS

3.1 Data Processing

Table 1. Number of work accidents / month CV. Gem 7 Wonogiri 2005 – 2007

Year	Number of Accidents	Month											
		Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sep	Oct	Nov	Des
2005	15	3	2	1	0	0	2	0	3	1	1	0	2
2006	13	2	3	1	1	1	0	0	1	2	1	0	1
2007	11	1	1	0	2	1	2	1	0	1	0	0	1

Table 2. The number of workers in the production and working hours CV. 7 Gems Wonogiri Year 2005-2007

Year	Total power work (person)	Number of hours worked / month (person hour)	Total number of hours work (person hours)
2005	110	19,250	231,000
2006	124	21,700	260,400
2007	145	25,375	304,500

Note: The number of working hours / month is the same. And the applicable working hours are 8 hours starting from 08.00 - 16.00 WIB with 1 hour rest time. Based on the work data above, the number of lost working hours from 2005 – 2007 is obtained as shown in the following table.

Table 3. Recapitulation of the number of hours lost by employees

Year	Days lost (days)	Lost hours (hours)
2005	106	742
2006	74	518
2007	71	497

In determining the number of measurements of work safety results and the value of T Congratulations on CV. Permata 7 for a period of 3 years for the period 2005-2007 required data from several incidents of work accidents, lost working hours and lost working days for production employees. These data are used to measure:

a. The level of frequency of work accidents.
b. The level of severity or severity of work accidents.
c. Measurement of T-Safety Value (Nts)

1. Measurement of the level of frequency / frequency of disability injuries.

To get the level of frequency / frequency of disability injuries, the formula used is as follows:

$$F = \frac{n \times 1{,}000{,}000}{N}$$ **(Budiono ; 1992)**

$$F\ (2005) = \frac{5 \times 1{,}000{,}000}{231{,}000}$$

= 64.9 • 65 per 1,000,000 hours worked

The frequency level in this period indicates that in one year, approximately 65 accidents resulting in injury have occurred for every one million man-hours worked. In the same way, the results of measuring the frequency of work accidents are as follows:

Table 4. Results of Measurement of the Frequency of Work Accidents

Year	Number of work accidents	F
2005	15	64.9
2006	13	49.9
2007	11	36.1

2. Measurement of the level of severity / severity of disability injuries.

$$S = \frac{H \times 1{,}000{,}000}{N}$$ (Budiono ; 1992)

$$S\ (2005) = \frac{742 \times 1{,}000{,}000}{231{,}000}$$

= 3,212.12 • 3,213 hours per 1,000,000 working hours

This means that in a year approximately 3,213 hours are lost for every 1,000,000 hours worked or 3,212 hours per million hours worked. In the same way, the results of the measurement of the level of safety / severity of work accidents are as follows:

Table 5. Severity Level Measurement Results

Year	Number of Hours Lost (Hours)	Number of Working Hours (Hours)	S
2005	742	231,000	3,212.12
2006	518	260,400	1989.25
2007	497	304,500	1,632.18

3. Measurement of Happy T Value (Nts).

The F1 value is taken from the previous year and the F2 value is the value in the year to be measured:

Table 6. Congratulations T Value measurement data

Year	Number of Working Hours (hours)	F1	F2
2005	231,000	-	64.9
2006	260,400	64.9	49.9
2007	304,500	49.9	36.1

ISSN 2086-7026 (Print), 2808-7372 (Online)

In the table above, there is an increase in the level of achievement of the frequency of work accidents in the present when compared to the past. Safe T Score is a number that has no dimensions. The meaning of a positive Safe T Score indicates a worsening situation, while a negative number indicates an improving condition. In the same way the results of the measurement of the safe T value are as follows.

Table 7. Congratulations T Value Measurement Results

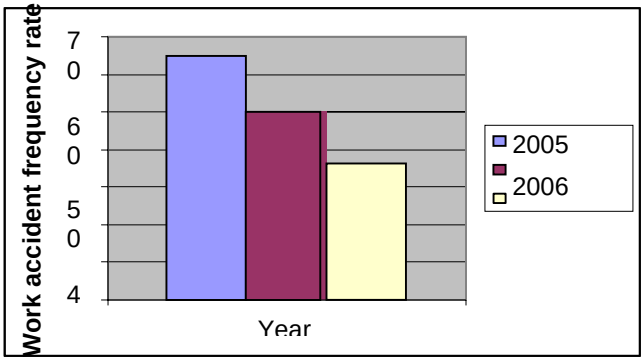
Year	Nts
2006	-950.2
2007	-1078.2

3.2 Analysis of Data Processing Results

After discussing the data above, it is very necessary for the author to analyze the results of the discussion. In the analysis, the author holds the basis of the results of measurements and calculations carried out. The analysis was carried out in 2005-2007, because it corresponds to the 3-year work safety program period.

a. Analysis of Work Accident Frequency Levels.

From the measurement results above, it can be seen that the level of frequency/frequency of accidents that occurred in 2005, 2006, 2007 was 64.9 ; 49.9 ; 36.1 . The figure shows that in one million hours of work from year to year is getting lower



Gamber 1 Graph of the frequency of work accidents

The measurement data above can be seen that the number of work accidents that occur from year to year is decreasing, this is due to the fact that in 2005 and 2006 the K3 program had not been implemented. For 2006 there was a decrease because in 2005 there were 20 people who had accidents, and In 2006 there were 16 people who had accidents.

b. Severity Level Analysis / Work Accident Severity.

The highest level of work accident severity occurred in 2005 at 3,212.12 with a total of 106 lost hours in 1,000,000 working hours. The severity of other work accidents was rather low in 2006 and 2007 namely 1,989.25 and 1,632.18.

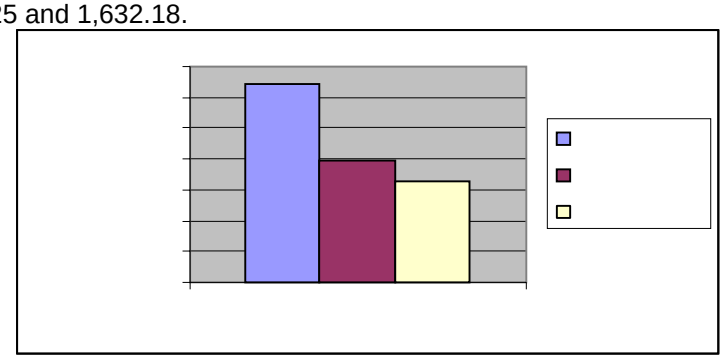


Figure 2 Work accident severity graph

It can be seen from the diagram above that from year to year the severity is getting lower, and this will have an effect on increasing work productivity.

c. Happy T-Score Analysis (Nts)

From the results of the measurement of NTS for 3 years, it was found that in 2006 the amount of NTS was -949.4 and 2007 was -1078.1. It can be described as follows:

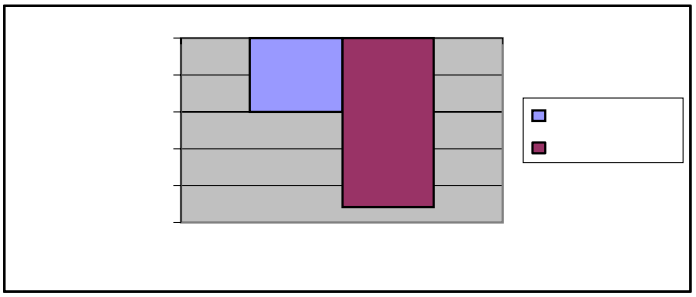


Figure 3 Graph of safe T-scores

It can be seen from the T-Score diagram above that the accident frequency value from 2006 to 2007 has decreased.

4. CONCLUSION

Based on the evaluation, measurement and analysis that has been done in CV. Permata 7 Wonogiri can be concluded as follows: The results of the measurement of the frequency of work accidents are known that in 2005 the frequency was 64.9. In 2006 it occurred with a frequency of 49.9. And in 2007 with a frequency of 36.1. The results of the severity of work accidents in 2005 were 3,212.12. In 2006 it was 1,989.25 and in 2007 it was 1,632.18. This means that the severity of work from year to year is decreasing and will be followed by an increase in employee work productivity. The results of the measurement of the survivor T value (Nts) in 2006 were known to be – 950.2 and in 2007 it was – 1078.2. So it can be concluded that from 2006 to 2007 the value of the frequency of current accidents has decreased to the value of the frequency of past accidents. Work accident at CV. Permata 7 can still occur, this is due to the carelessness of the employees in carrying out their duties and many employees who do not heed the advice of the company or do not use the personal protective equipment provided by the company. It can be seen from the results of the analysis of the relationship between work safety and productivity that the fewer accidents that occur, the smaller the lost working days and result in higher levels of productivity. This is due to the carelessness of employees in carrying out their duties and many employees who do not heed the advice of the company or do not use the personal protective equipment provided by the company. It can be seen from the results of the analysis of the relationship between work safety and productivity that the fewer accidents that occur, the smaller the lost working days and result in higher levels of productivity. This is due to the carelessness of employees in carrying out their duties and many employees who do not heed the advice of the company or do not use the personal protective equipment provided by the company. It can be seen from the results of the analysis of the relationship between work safety and productivity that the fewer accidents that occur, the smaller the lost working days and result in higher levels of productivity.

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