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EVALUATION OF OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM (OHSMS) IMPLEMENTATION AT PT XYZ

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Abstract — PT XYZ is an oil and gas infrastructure management and supply service company that has a very high level of work-related accident risk in every work activity. The company has a history of high cases of LTI / lost time injury (death/disabled) and non-LTI (first aid/near miss/property damage) work-related accidents in 2016 – 2020 so that the company's OHS target of Zero Accident (LTI=0) is not achieved. This study aims to 1) determine the factors causing the high rate of work-related accidents; 2) figure out how to improve OHS performance; 3) figure out the OHS program recommendations. This research is qualitative research with an exploratory approach based on a case study of OHS aspects in the company. The population of this study was 2,960 people and 118 people were taken as a sample. This study uses the Fishbone Diagram, 5Whys, and 5W+1H analysis methods to find out the root causes of the high rate of work-related accidents. The results of this study indicate that the cause of work-related accidents with the highest percentage is the Manpower aspect (47.4%), followed by the Method aspect (22.7%), Material (13.7%), Machine (6.5%), Environment (5.8%), and Measure (3.9%). This research shows the implications for the Company that by taking corrective actions and following up on research recommendations, the number of work-related accidents can decrease significantly in the period 2020 – 2021. According to the data, after the corrective action is implemented, the number of work-related accidents decreased to LTI (1 case) and non-LTI (16 cases); the number of OHS non-conformance audit results is 55 findings; the number of OHS non-conformance in the previous period that had not been followed up is 6 findings; OHSMS Application Score reached 96.38%. It is because there are managerial implications that have a real impact on company management which previously had a Profit Oriented mindset that has changed into Safety Oriented in every implementation of the company's business activities.

Keywords — *Occupational Health and Safety (OHS), OHS Management System, Fishbone Diagram, 5Why, 5W+1H.*

I. INTRODUCTION

According to data from National Social Security Agency for Employment (BPJS Ketenagakerjaan), work-related accidents cases of LTI (Loss Time Injury) and non-LTI in Indonesia have increased significantly in the last 5 years, namely in the period 2016 to 2020 according to **Figure 1.** The graph of work-related accidents in Indonesia is as follows:

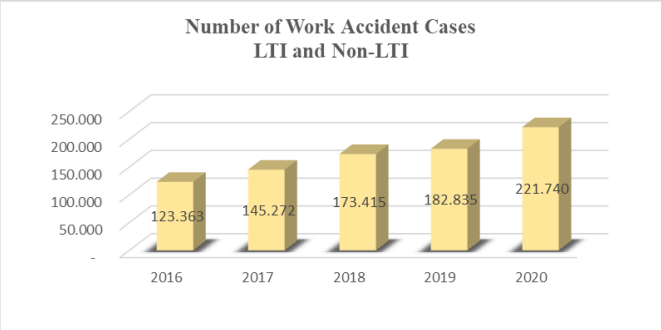

Figure 1. Graph of Work-related accident Cases in Indonesia 2016 – 2020
Source: Data Processing Results of BPJS Ketenagakerjaan Report 2016 – 2020

PT XYZ is an oil and gas infrastructure management and supply service company that has a very high level of work-related accident risk in every work activity. PT XYZ is a company that provides various services in the management and provision of oil and gas infrastructure, such as:

a) Engineering, Procurement, and Construction (EPC)
b) Operation and Maintenance (O&M)
c) Supply Chain

In running the company's business, PT XYZ has various problems in the field of Occupational Health and Safety (OHS), namely LTI (death/disability/medical treatment case) accident cases at PT XYZ in the last 5 years (2016 – 2020) are still relatively high so that the company's target of Zero Accident (Zero LTI) was not achieved. In addition, non-LTI (first aid/near miss/property damage) accident cases that occurred at PT XYZ were relatively high every month in the last 5 years (2016 – 2020). PT XYZ accident cases can be seen in the following table:

Table I. PT XYZ Work-related accident Statistics

No	Month	LTI Work-related accident					Non-LTI Work-related accidents				
		2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
1	January	0	0	1	0	2	4	2	3	7	4
2	February	0	1	0	1	0	3	6	4	2	5
3	March	1	0	0	0	1	5	2	8	4	3
4	April	0	0	1	1	2	3	5	4	6	3
5	May	1	1	0	1	0	2	4	5	9	7
6	June	0	2	0	1	1	6	7	6	3	11
7	July	0	0	1	0	0	4	3	3	6	5
8	August	1	0	1	0	1	2	5	8	4	8
9	September	0	1	0	1	1	2	4	2	5	6
10	October	0	0	1	1	0	2	1	3	9	4
11	November	0	0	0	1	1	3	1	5	3	7
12	December	0	0	1	0	0	2	3	4	2	9
Total Accidents		**3**	**5**	**6**	**7**	**9**	**38**	**43**	**55**	**60**	**72**

Source: Data Processing Results of PT XYZ Work-related accident Report 2016 – 2020

In carrying out the operational activities of the company, apart from the problem of work-related accidents, there are also other OHS problems. Based on the OHS audit non-conformance reports carried out annually by the Internal Auditor there is an increase in the number of OHS audit non-conformance which are increasing every year in the last 5 years (2016 – 2020 period) according to the OHS audit non-conformance report data as shown in **Figure 2.** The graph of the OHS audit non-conformance results is as follows:

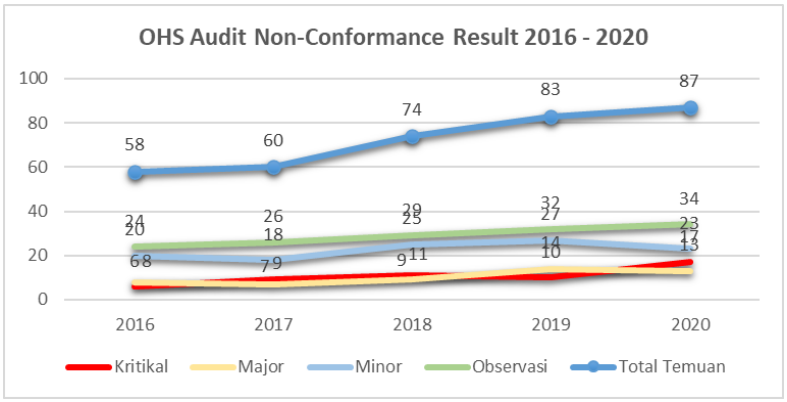

Figure 2. Graph of OHS Audit Non-Conformance Results in 2016-2020
Source: Data Processing Results of PT XYZ OHS Audit Non-conformance Report 2016 – 2020

PT XYZ has 2960 workers that have a high risk of work-related accidents, so based on laws and regulations it is mandatory to implement an Occupational Health and Safety Management System (OHSMS) according to Government Regulation Number 50 of 2012.

Another OHS problem at PT XYZ is that there are OHS Audit Non-conformance findings that have not been followed up by the company. The number of findings that have not been followed up is shown in Figure 3. OHS Audit Non-conformance Findings 2016 – 2020 are as follows:

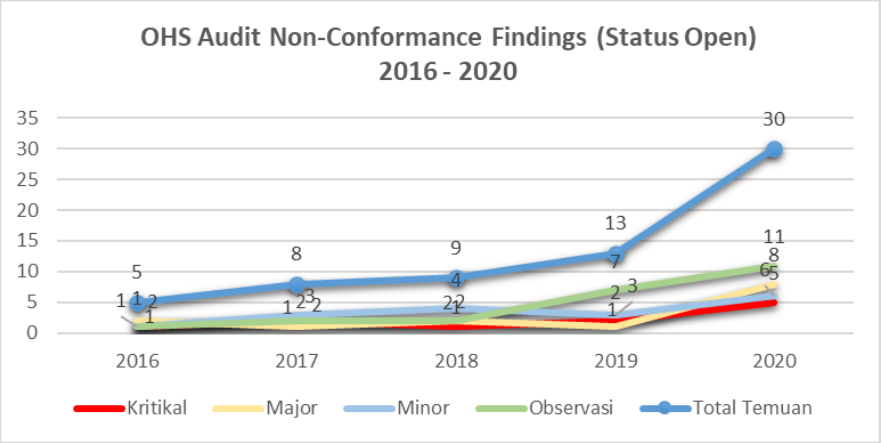

Figure 3. OHS Audit Non-Conformance Findings (Status Open) 2016-2020
Source: PT XYZ OHS Non-conformance Audit Follow-Up Data Processing Results in 2016 - 2020

Based on the above phenomena, it is necessary to conduct this research, and carry out the Evaluation of the Occupational Health and Safety Management System (OHSMS) Implementation at PT XYZ so that the factors causing the high rate of work-related accidents can be identified, the results of OHS Audit non-conformance and findings that have not been followed up and provide recommendations on factors that need to be improved to suppress or reduce the number of work-related accidents at PT XYZ so that the company's targets of zero accidents or no LTI work-related accidents can be achieved.

II. LITERATUR REVIEW

A. Occupational Health and Safety Management System (OHS)

The Occupational Health and Safety Management System, hereinafter abbreviated as OHSMS, is part of the overall company management system to control risks related to working activities to create a safe, efficient and productive workplace (Government Regulation No. 50 of 2012).

To implement the OHS Management System as stated in article 6 Government Regulation No. 50 of 2012, organizations are required to implement OHSMS which is carried out based on national policy. The intended national policy on OHSMS includes 5 (five) basic principles for implementing the OHS Management System, namely Policy Stipulation, OHS Planning, Implementation of OHS Plans, Monitoring and Evaluation of OHS Performance, and Performance Review & Improvement (Tarwaka, 2017).

B. Occupational Health and Safety (OHS)

According to Mathis and Jackson (2007: 412), Occupational Health and Safety (OHS) is an activity that guarantees the creation of safe working conditions, avoids physical and mental disorders through coaching and training, briefing and control over the implementation of tasks from employees and providing assistance according to the rules from government institutions and companies where they work.

Ardana (2012: 208) states that Occupational Health and Safety (OHS) is a protection effort aimed at ensuring that workers and other people at work are always in a safe and healthy condition so that every source of production can be used safely and efficiently.

C. Occupational Health and Safety (OHS)

Occupational accidents are unexpected events that are the result of a series of events involving 4 (four) causal factors in the workplace, namely the environment, hazards, equipment, and people (Pratiwi, 2012). According to HW Heinrich's theory of the domino effect which was introduced in 1931, the causes of work-related accident cases consisted of 88% unsafe acts, 10% unsafe conditions, and 2% unavoidable. (Pratiwi, 2012).

Unsafe actions can undermine best efforts to minimize unsafe conditions, but unfortunately, it's not an easy answer to the question of what causes them. Hence, even though some people believe that almost all people who are easily disturbed are impulsive. Accident prevention starts with two basic activities, namely reducing unsafe conditions and reducing unsafe actions (Dessler, 2007: 282).

D. Seven Basic Tools of Quality (QC 7 Tools)

Seven Basic Tools of Quality (QC 7 Tools) are used to process data in an efficient way to formulate data (Neyestani, 2017), namely:

1. Check Sheet

It is used to facilitate data collection, marking data with a simple symbol and formulating it for easy understanding of the Check Sheet. A check Sheet is used when determining inspections and ensuring the results of previous inspections and checking them one by one to prevent accidents or errors while working.

2. Cause and Effect Diagram (Ishikawa Diagram)
   It is used to find the factors that influence quality characteristics. An image that shows a glimpse of the relation between an outcome and the many causes that influence the outcome.
3. Pareto Chart
   It is used to show the main problem sequence. The data is divided and arranged according to parts and sorted according to magnitude. This graph shows where the problem usually occurs and the rate at which it increases.
4. Histogram
   It is used to describe the distribution of data. The bar graph shows the data obtained from a condition and is divided into several sections and is made according to the data values contained in the sections.
5. Graph
   It is used to show in detail the factors and quality characteristics. The data is arranged and graphed so that it is easy to see the changes and the magnitude according to the part.
6. Scatter Diagrams
   It is used to determine the correlation between the factors that will affect the quality characteristics.
7. Control Chart
   It is used to indicate the maximum limit and minimum limit of the control area

E. Fishbone analysis

Fishbone analysis or what is often called a cause-effect diagram is a method used to help solve existing problems by conducting a cause-and-effect analysis of a situation in a diagram that looks like a fishbone. Fishbone analysis can function as one of the tools to identify possible causes of a specific problem and then separate the root cause, it is also possible to identify solutions that can help solve the problem (can be more than one problem).

F. 5 Why analysis

Five Whys Analysis (なぜなぜ分析 Naze Naze Bunseki) or 5 Whys is a simple question-and-answer technique for investigating causal relationships that are at the root of a problem Olivier Serrat (2009).

According to Wang, John X. (2008), the 5 Whys Technique is the practice of asking, “why” five times, and why a technical problem occurs to determine the root cause of a damage or problem. This technique was developed by Sakichi Toyoda and was later used by the Toyota Motor Corporation. In the 1970s, the 5 Whys strategy was popularized by the Toyota Production System. This method is now used as one of the methods in the Six Sigma strategy. The benefits of the 5 Whys Analysis include:

- Quickly identify the root cause of a problem
- Determine the relationship between the different root causes of a problem
- One of the simplest method
- Easy to learn and apply

G. 5W+1H Analysis

5W1H in Indonesian is known as "Asdikamba" or "Adiksimba" namely *apa* (what), *siapa* (who), *dimana* (where), *kapan* (when), *mengapa* (why), and *bagaimana* (how). The 5W1H formulation is considered to be the easiest to solve various problems and formulate information. Even though it looks concise, the 5W1H elements are considered capable of being a full guideline for developing a story or information. In general, 5W1H is referred to as a method that contains questions that are used as a basis for gathering information or solving problems. These questions include elements of what, who, when, where, why, and how.

The following is an explanation of each element of the 5W+1H questions:

1. What: The what element explains what happened or what is the discussion of the topic you want to write or review. In short, this question asks about the core problem of the event you want to convey.
2. Who: The element that becomes a question that leads to the subject or actor of the event or problem being reviewed. This is used to find out who was involved in the related event.
3. When: The element of when focuses on information about the time of the problem or event that occurred. This element becomes an explanatory tool that helps explain information more accurately and reliably.
4. Where: The element where becomes one of the descriptions that explain where an event or problem occurs. It can be an element that provides physical evidence regarding the continuation of an event or issue.
5. Why: The why element focuses on the reason or background of the event or problem being reviewed. This can be an element that can help develop information related to existing problems or events.

6. How: The element of how focuses on ways, explanations, and descriptions of an event that can occur. This element is also a statement that supports the why element that has been described previously.

The following is an example of a 5W+1H question as follows:

- What : What happened?
- Who : Who was involved in the event?
- Why : Why did this happen?
- When : When did the event occur?
- Where : Where did the event take place?
- How : How did this event happen?

By fulfilling all the 5W+1H elements, the main information in news writing will be much more complete.

Researchers develop a research framework as a design that is used to assist researchers in completing the writing that has been made. This frame of mind is made in the form of pictures or charts which are then arranged so that the charts are connected. The framework of thought in this study is as stated in Figure 4. as follows:

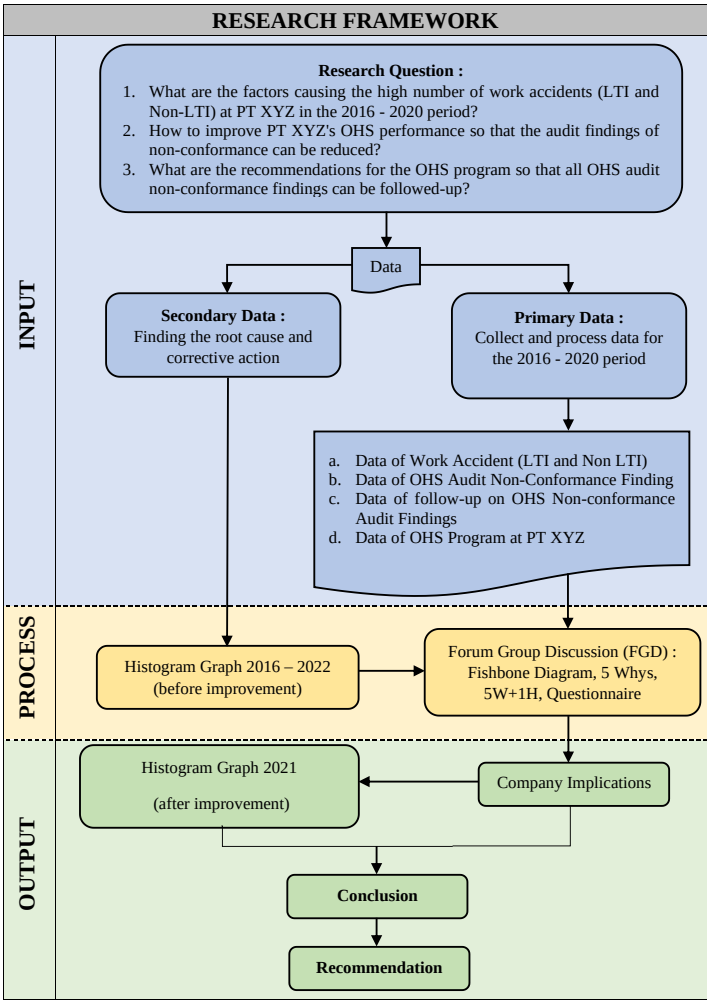

Figure 4. Research Framework
Source: Processing Results, 2022

III. METHOD

A. Study Design

This research was conducted using a qualitative method with an exploratory approach from case studies using OHS performance data, work-related accident statistics, OHS audit non-conformance finding data, and follow-up data on OHS audit non-conformance audit findings in the period 2016 – 2020 and using descriptive model to describe the phenomenon which is used as a result of processing, observation, and analysis of each variable as a basis for making decisions in solving OHS problems. This research was conducted at an Operation and Maintenance (O&M), Engineering, Procurement, and Construction (EPC), and Oil and Gas Infrastructure Supply Chain service company at PT XYZ which became the object of research for further improvement in their implementation of Occupational Health and Safety Management System.

B. Definition and Operationalization of Variable

The research was carried out at PT XYZ by making initial observations of OHS performance data, statistical data on work-related accidents, data on OHS audit non-conformance, and follow-up data on OHS audit non-conformance in the period 2016 – 2020 and then carrying out further observations in 2021 which start implementing "Assessment of OHS Management System Implementation" which can be shown in OHS performance data, statistical data on work-related accidents, data on OHS Audit non-conformance findings and follow-up data on OHS Audit non-conformance findings in 2021. The details of the definition and operationalization of the research variables are in Table II as follows:

Table II. PT XYZ's Work-related accident Statistics

Research variable	Dimensions	Method
OHS performance data, statistical data on work-related accidents, data on OHS audit non-conformance, and follow-up data on OHS audit non-conformance (data for the period 2016 – 2021)	A Fishbone diagram is used to find potential causes according to the main cause categories	6M : • Manpower • Method • Machine • Money • Material • Measure
	5 Why analysis is a simple question-and-answer technique to investigate causal relationships that are the root cause	*Why* analysis : • Why • Why • Why • Why • Why
	5W+1H is used for: 1. Finding the root cause of all the sub-causes of each main cause 2. Develop a corrective action plan	5W+ 1H : • What • Who • Where • When • Why • How

C. Population and Sample

According to Sugiyono (2016: 80) "Population is a generalized area consisting of objects or subjects that have certain qualities and characteristics set by researchers to study and then draw conclusions."

The population is the total collection of elements that are expected to be studied and then it is hoped that conclusions can be drawn (Cooper and Schindler, 2011: 364), in which elements in the population are individual participation or an object that is taken to be known (Cooper and Schindler, 2011: 364).

In this study, the population taken was company OHS performance data and OHS management system performance at PT XYZ from 2016 to 2021. The population in this study were all employees of PT. XYZ which amounted to 2960 people.

The total population of the company workers involved in this study is as follows:

a. Employee Involvement in the Survey

The number of PT XYZ employees who will be involved in the survey is 118 people consisting of Head Office workers and Area Office workers.

b. Employee Involvement in Focus Group Discussion (FGD)

The number of PT XYZ employees who will be involved in the Focus Group Discussion (FGD) is 10 people consisting of:

- 2 workers at the level of Division Head
- 2 workers at the level of Department Head
- 2 workers at the level of Project Manager
- 2 workers at the level of Area Head
- 2 OHS Workers

c. Employee Involvement in Interviews

The number of PT XYZ workers who will be involved in the interview is 5 people consisting of:

- 4 Directors
- 1 Worker at the level of Division Head

The sample is part of the number that belongs to the target population and the sample size must be chosen carefully so that it can describe a population. (Cooper and Schindler, 2011:88). If the sample is selected, the

researcher must be able to determine the characteristics and how many people will be interviewed, the selection of events and the number of events to be studied, or how much data will be studied (Cooper and Schindler, 2011: 88).

The research samples taken in this study are OHS performance data, work-related accident statistics, data on OHS audit non-conformance, and follow-up data on OHS audit non-conformance audit findings in the period 2016 – 2021.

The sampling method in this study was purposive sampling. The selected sample is Company Officials at a minimum level of Manager, Department Head, and Division Head who are directly involved in the process of implementing the OHS Management System (OHSMS) at PT. XYZ. The sample in this study can also be referred to as research informants.

D. Research Flow

The flow of research in this study began with the collection of OHS performance data, statistical data on work-related accidents, data on OHS audit non-conformance findings, and follow-up data on OHS audit non-conformance audit findings in the period 2016 – 2021. The research flow is a way of thinking sequentially to solve a problem which can be seen in Figure 5. The research Flow is as follows:

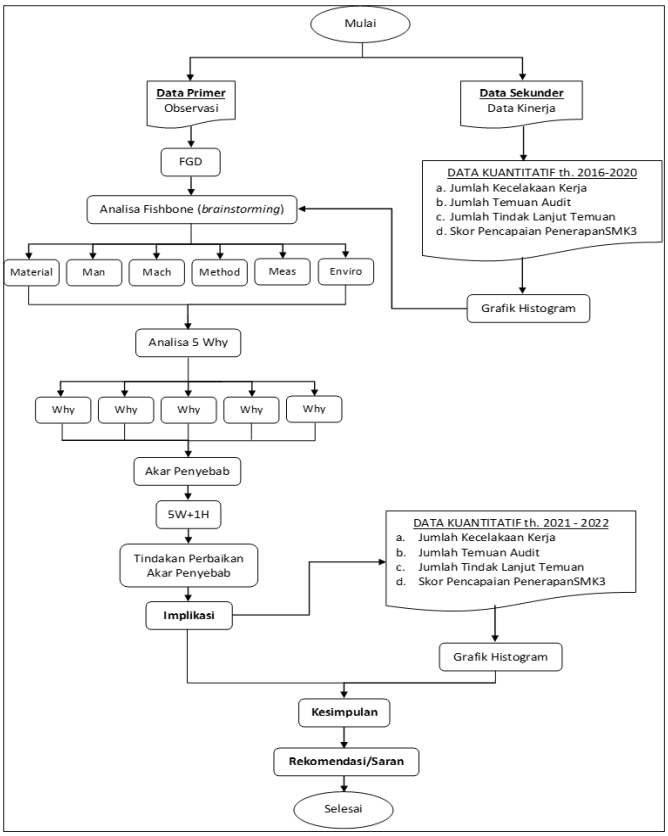

Figure 5. Thinking Framework
Source: Data Processing Results, 2022

E. Data analysis method

Data analysis is the activity of processing the data that has been collected and then analyzed using research methods: Histogram graph, Fishbone diagram, 5 Whys, 5W+1H, Audit evaluation checklists, and "network" of quality management documents within PT XYZ's corporate organization. The following is a table of research method matrix used in this study as shown in Table III as follows:

Table III. Research methods

Research variable	Research methods				
	Histogram Graph	Fishbone	5 Whys	5W+1H	Checklists & Network Documents
Data of OHS Performance	√	√	√	√	√
Data of Work-related accident	√	√	√	√	√
Data of OHS Internal Audit Finding	√	√	√	√	√

Research variable	Research methods				
	Histogram Graph	Fishbone	5 Whys	5W+1H	Checklists & Network Documents
Daata of OHS External Audit Findings	√	√	√	√	√
Data of Follow-up on OHS Internal Audit Findings	√	√	√	√	√
Data of OHS External Audit Follow-Up	√	√	√	√	√

Source: 2022 Data Processing Results

IV. RESULT AND DISCUSSION

A. Fishbone Diagram Analysis

Based on the Fishbone diagram analysis from the results of discussions with FGDs through a brainstorming process, it was found that there were main causes that were suspected of occurring, namely in the aspects of Man Power, Material, Machine, Method, Measure, and Environment. Causes in aspects are selected based on their contribution to work-related accidents (LTI and non-LTI). According to data sources, it shows that Man Power is the most influential aspect of the cause of work-related accidents (47.4%), followed by aspects of Method (22.7%), Material (13.7%), Machine (6.5%), Environment (5.8%), and Measure (3.9%). To find out the root cause of the problem in more detail so that recommendations can be obtained more precisely on target, the author conducts a more detailed Fishbone Diagram Analysis based on the most influential aspect, namely Man Power. Man Power Fishbone Diagram details are shown in Figure 6 below:

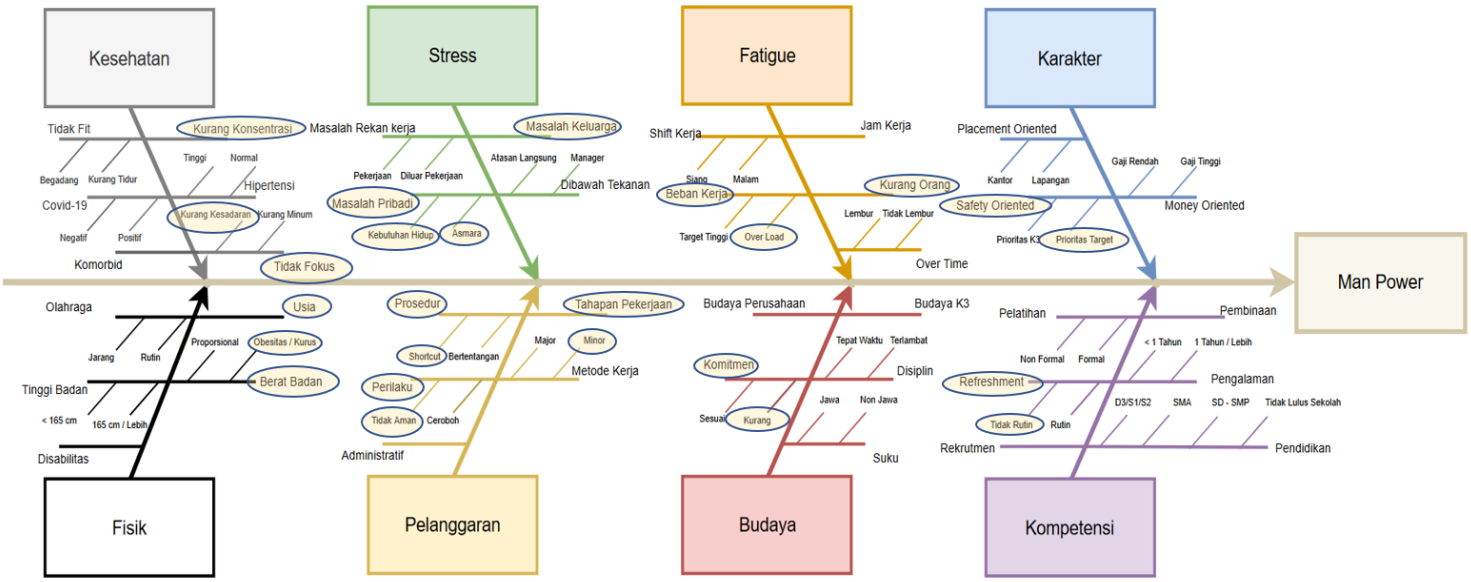

Figure 6. Fishbone Diagram Analysis
Source: Data Processing Results, 2022

B. 5 Whys Analysis

The cause of the Man Power aspect of work-related accidents is then carried out in more detail analysis to find the root cause of the problem with the 5 Whys method as shown in table 4.9. as follows :

Table IV Analysis of 5 Whys Work-related Accident Cases (LTI and non-LTI)

ROOT CAUSE ANALYSIS WITH 5 WHYS					FGD participants: Head of Work Unit and Investigation Team	
Issue Title: Work-related Accident Cases (LTI and non-LTI)						
Meeting Date: January 4, 2021						
No.	Problem	Why-1	Why-2	Why-3	Why-4	Why-5
		Cause-1	Cause-2	Cause-3	Cause-4	Cause-5
1.	Some Workers are less competent	Refreshment Training is not conducted regularly	There is no training refreshment cost	Not included in the work program	Not included in the work contract	There is no risk mitigation related to refreshment training

ROOT CAUSE ANALYSIS WITH 5 WHYS					FGD participants: Head of Work Unit and Investigation Team	
Issue Title: Work-related Accident Cases (LTI and non-LTI)						
Meeting Date: January 4, 2021						
No.	**Problem**	**Why-1**	**Why-2**	**Why-3**	**Why-4**	**Why-5**
		Cause-1	Cause-2	Cause-3	Cause-4	Cause-5
2.	Characteristics of Workers: Safety is not a Top Priority	Workers tend to ignore OHS Aspects in carrying out work	The Supervisor of Work does not give direction and lacks *concern* of OHS Aspect	The Project Manager gives orders to the Supervisor to accelerate the completion of work	Project Managers see cost savings opportunities if work is completed faster	Determination of high margins to the Project Manager for the work that has been carried out
3.	The OHS culture has not been fully embedded in the employee's personality	Employees do not have a strong commitment regarding the implementation of OHS culture	Workers do not want to change the culture that has become a habit	Employees feel comfortable with the existing culture	Workers' understanding of OHS culture is still lacking	Most workers only get OHS training once during the *Safety Induction*
4.	Some Workers experience Fatigue	Some workers experience an overloaded workload	Several workers concurrently hold at least 2 project positions	The number of workers does not match the project's needs	No one was selected / unsuitable during the recruitment process	Incompatible with the qualifications / The salary requested is very high
5.	Some workers have violated OHS rules	Workers violate procedures by performing *shortcuts* that are not in accordance with work methods and stages of work	Workers want to get work done quickly	Work is late compared to the predetermined progress target	Several daily targets for work progress were not achieved	Rainfall is high and there was frequent rain so work stopped until the weather cleared
6.	Some workers experience stress due to various problems	Workers get mental stress and burden of mind that comes from home as well as from the workplace	Monthly living needs are not fulfilled	Late payment of employee attendance allowance	Long and bureaucratic financial administration process	The payment mechanism always changes according to the procedures of the Employer/Owner
7.	The health condition of some workers is worsening/not optimal	Workers are not focused and lack concentration when working	Workers' lack of rest / not enough sleep	Workers often work late until night to finish work	The supervisor orders workers to work overtime to catch up with work targets	The supervisor was asked by the Project Manager to accelerate the completion of the work
8.	Some Workers' Physical Conditions are disproportionate	Some workers are recommendations by local residents who have an influence on residents around the work location	The project manager establishes a policy to prioritize local residents to be employed in project activities	There are no specific physical condition requirements for workers during the recruitment process	There is no specific procedure that regulates the requirements for the physical condition of workers specifically at the recruitment process	The Project HR function does not have the authority to develop work procedures

As an effort to improve the implementation of OHSMS at PT XYZ, this study will analyze 3 (three) processes with the lowest percentage values, including Leadership and Accountability (85.71%), Management Review (75%), and Implementation and Operational Control (70%)). To increase the achievement of the 3 (three) criteria, the researcher conducted a study to find the root causes using the 5 Whys method as shown in Table V as follows:

Table V 5 Why Analysis of OHSMS Evaluation Results

ROOT CAUSE ANALYSIS WITH 5 WHY					FGD participants: OHSMS Auditor and Head of Work Unit	
Issue Title: OHSMS Evaluation Results						
Meeting Date: January 11, 2021						
No.	**Problem**	**Why-1**	**Why-2**	**Why-3**	**Why-4**	**Why-5**
		Cause-1	Cause-2	Cause-3	Cause-4	Cause-5
1.	Senior managers are not actively involved in OHS management aspects	Senior managers feel that it is not in their main interest to be involved in OHS management aspect	Many other aspects are considered more important to involve senior managers	Lack of awareness of senior managers regarding the importance of OHS management in every aspect of work	Senior Manager has not been trained in OHS aspect	The annual training target for senior managers does not require OHS training

ROOT CAUSE ANALYSIS WITH 5 WHY						FGD participants: OHSMS Auditor and Head of Work Unit
Issue Title: OHSMS Evaluation Results						
Meeting Date: January 11, 2021						
No.	**Problem**	**Why-1**	**Why-2**	**Why-3**	**Why-4**	**Why-5**
		Cause-1	Cause-2	Cause-3	Cause-4	Cause-5
2.	Implementation of management review has not been carried out comprehensively	The management review conducted by the company does not touch the root cause of the problem	Many aspects become management priorities	Company Targets and Problems Are Very Complex	Setting Company Targets and Solving Company Problems is not risk-based	The company obtains target setting from the holding company
3.	Management review results have not been consistently followed up	No procedure regulates the follow-up of the management review results	No PIC is clearly appointed to be responsible for following up on the results of the management review	The workload of each worker is already very high so the worker is unable to become the PIC of management review follow-up	The required number of workers has not been fulfilled in accordance with the existing formation	There is a Company policy to temporarily suspend the recruitment of Workers
4.	Implementation of Management of Change (MOC) is running less effective	There is no PIC appointed by the work unit for implementing the MOC	Work units do not have workers who are competent in implementing MOC	Workers have never had any training/socialization related to MOC	MOC training/socialization has never been carried out in the company	The instructor/ presenter in charge of MOC training has retired
5.	Implementation of work by partners/ sub-contractors does not fulfill OHS aspects	The implementation of Sub Contractors Management is more focused on other things than OHS aspects	The reward and punishment system related to the OHS aspect has not been optimally implemented in the Project	Lack of supervision from management regarding OHS aspects	There are no procedures related to monitoring the fulfillment of OHS aspects	The work contract does not discuss in detail regarding OHS aspects

C. 5W+1H analysis

Based on the results of the 5 Whys analysis, corrective actions are then determined concerning work-related accident cases using the 5W+1H method based on the main causes according to Table VI. as follows :

Table VI Analysis of 5W+1H Work-related Accident Cases (LTI and non-LTI)

DETERMINATION OF ACTION WITH 5W + 1H					FGD participants: Head of Work Unit and Investigation Team	
Issue Title: Work-related accident Cases (LTI and non-LTI)						
Meeting Date: January 25, 2021						
No.	What	Why	How	Where	When	Who
	Problem	Main cause	Corrective action	Where	When	PIC
1.	Some Workers are less competent	There is no risk mitigation related to refreshment training	Input refreshment training for employees regularly as a part of risk mitigation	Planning Stage by Commercial Division and relevant Work Unit related to Project Bidding	During the preparation stage of the Project bid	Commercial Division and Project-Related Work Units
2.	Characteristics of Workers: Safety is not a Top Priority	Determination of high margins to the Project Manager for the work that has been carried out	Margin setting must be adjusted to the risks and operational needs of the work so that it cannot be always targeted with a high percentage	Commercial Division and Project-Related Work Units	When preparing the Project Charter or proposing margin target setting to the Board of Directors of the Company	Commercial Division and Project-Related Work Units
3.	The OHS culture has not been fully embedded in the employee's personality	Most workers only get OHS training once during the *Safety Induction*	All workers receive more intensive training related to OHS Culture so that Worker Behavior related to OHS will be formed faster and better	OHS Function in Project-Related Work Units	Project Implementation Location	OHS Function in Project-Related Work Units

DETERMINATION OF ACTION WITH 5W + 1H					FGD participants: Head of Work Unit and Investigation Team	
Issue Title: Work-related accident Cases (LTI and non-LTI)						
Meeting Date: January 25, 2021						
No.	What	Why	How	Where	When	Who
	Problem	Main cause	Corrective action	Where	When	PIC
4.	Some Workers experience Fatigue	Incompatible with the qualifications / The salary requested is very high	The need for workers related to the project must be met in accordance with the qualifications so that the worker does not hold multiple positions/positions in several projects	Human Resources Division and Project-Related Work Units	During the selection/recruitment stage of Workers for Project needs	Human Resources Division and Project-Related Work Units
5.	Some workers have violated OHS rules	Rainfall is high and there was frequent rain so work stopped until the weather cleared	High rainfall causes work to be hampered so that the set targets are not achieved, this causes workers to accelerate work by violating procedures	Project Work Unit and Project Manager	At the time of work execution	Project Work Unit and Project Manager
6.	Some workers experience stress due to various problems	The payment mechanism always changes according to the procedures of the Employer/Owner	The payment mechanism by the Employer (Owner) is always changing so it has an impact on delays in the payment of Worker attendance allowances	Finance Division and Project Manager	During the billing process the term/payment progress	Finance Division and Project Manager
7.	The health condition of some workers is worsening/not optimal	The supervisor was asked by the Project Manager to accelerate the completion of the work	Work supervisors are burdened by high work targets but are not matched by adding the number of personnel and work equipment so it impacts the health of workers	Project Manager	At the time of work execution	Project Manager
8.	Some Workers' Physical Conditions are disproportionate	The Project HR function does not have the authority to develop work procedures	The Project HR function does not have the authority to develop/update procedures so that the conditions of some workers are disproportionate and do not match the needs in the field	Head Office HR Division and Project HR Function	At the time of preparing personnel qualifications before the worker recruitment process	Head Office HR Division and Project HR Function

Based on the results of the 5 Whys analysis, corrective action was then determined on the results of the OHSMS evaluation using the 5W+1H method based on the main causes according to Table VII. as follows :

Table VII 5W+1H Analysis of OHSMS Evaluation Results

DETERMINATION OF ACTION WITH 5W + 1H					FGD participants: OHSMS Auditor and Head of Work Unit	
Issue Title: OHSMS Evaluation Results						
Meeting Date: 2 February 2021						
No.	What	Why	How	Where	When	Who
	Problem	Main cause	Corrective action	Where	When	PIC
1.	Senior managers are not actively involved in OHS management aspects	The annual training target for senior managers does not require OHS training	Ensuring senior managers conduct OHS training once a because it is very important for the future aspects of the company's business	Headquarters	2021 to 2022	Head of Work Unit and Head of HSSE Division

2.	Implementation of management review has not been carried out comprehensively	The company obtains target setting from the holding company	Submitting proposals to the Holding Company so that the company's target is set based on the company's business risk	Headquarters	2021 to 2022	Head of Work Unit and Head of HSSE Division
3.	Management review results have not been consistently followed up	There is a Company policy to temporarily suspend the recruitment of Workers	Accelerate the evaluation of HR needs so that additional work personnel can be recruited if needed	Head Office and Work Locations	2021 to 2022	Head of Work Unit and Head of HR Division
4.	Implementation of Management of Change (MOC) is running less effective	The instructor/ presenter in charge of MOC training has retired	Ensuring the availability of MOC training instructors/presenters available	Headquarters	2021 to 2022	Head of Work Unit and Head of HR Division
5.	Implementation of work by partners/ sub-contractors does not fulfill OHS aspects	The work contract does not discuss in detail regarding OHS aspects	Ensure work contracts are detailed regarding OHS aspects so that work partners/sub-contractors cannot have reasons not to fulfill OHS aspects	Head Office and Project Location	2021 to 2022	Head of Work Unit and Project Manager

The method that has been done is to identify the problem using a fishbone analysis diagram (brainstorming). Next, a selection is made of the most significant root cause of the problem on the main cause aspect (6M). Next, to find the root cause of the problem, an investigation is carried out using the 5 Whys method and followed by determining corrective actions using the 5W + 1H method. The implications of implementing corrective actions are explained in the matrix in Table VIII as follows:

Table VIII Matrix of Research Implications for PT XYZ

No.	Problem	Before Improvement (2016 – 2020)	After Improvement (2021-2022)	Corrective Action
1.	OHS accident cases (LTI and non-LTI)	**LTI** 2016 : 3; 2017: 5; 2018: 6; 2019: 7; 2020: 9 **Total: 30** **Non-LTI** 2016 : 38; 2017 : 43; 2018 : 55; 2019 :60; 2020 :72 **Total : 268**	**LTI** 2021 :1; 2022 :0 **Total : 1** **Non LTI** 2021 : 11; 2022 : 5 **Total : 16**	1. Conducting better HR evaluations and increasing competency so that employees are fit to work 2. Take a more effective approach when providing education so that it can be well received 3. Accelerate the evaluation of HR needs so that additional work personnel can be recruited immediately if needed
2.	OHS Audit Non-conformance Results	**Total Findings** 2016: 58; 2017: 60; 2018: 74; 2019: 83; 2020: 87 **Total: 362**	**Total Findings** 2021: 40; 2022: 15 **Total: 55**	1. Create an audit checklist for the auditor's reference in the audit process 2. The auditor carries out the audit process according to the audit schedule by checking the suitability and adequacy of OHSMS based on Government Regulation No. 50 of 2012 3. Compile audit reports on observation sheets containing positive observations, observations, and non-conformance findings (NC) 4. Compile a histogram graphical

No.	Problem	Before Improvement (2016 – 2020)	After Improvement (2021-2022)	Corrective Action
				analysis of the results of an assessment of the effectiveness of OHSMS implementation 5. The audit results report is in the form of a detailed assessment of the effectiveness of OHSMS for all audit objects in the form of a histogram graph for top management and line management
3.	OHS audit non-conformance results that have not been followed up	**Findings** **Open Status :** 2016: 5; 2017: 8; 2018: 9; 2019: 13; 2020: 30 **Total: 65**	**Findings** **Open Status :** 2021: 4; 2022: 2 **Total: 6**	1. Remind the work unit regularly 2. Recording or updating the recapitulation of audit results 3. Appoint PIC to follow up on audit results
4.	OHSMS score	**OHSMS score:** 2016: 91.57%; 2017: 89.16%; 2018: 87.35%; 2019: 85.54%; 2020: 85.54% **Average: 87.83%**	**OHSMS score:** 2021: 95.18%; 2022: 97.59% **Average: 96.38%**	1. Carry out preparation or pre-audit by each work unit 2. Embedding an OHS culture in every worker activity 3. Monitor the implementation of OHSMS periodically in each work unit
5	Managerial Implications	**2016 – 2020 :** Management's priority is *Profit Oriented*	**2021 – 2022 :** Management's priority is *Safety Oriented*	1. Management does not want the profit earned by the company to be tainted by work incidents 2. Management makes decisions based on existing OHS risks

V. CONCLUSION

This research was conducted at PT XYZ from January 2021 to August 2022 using PT XYZ data in 2016 – 2022 period. The conclusions that can be drawn by researchers are as follows;

1. Factors causing the high work-related accidents (LTI and non-LTI) in the PT XYZ are the Human Factor of 47.4%, the Method Factor of 22.7%, the Material Factor of 13.7%, the Machine Factor of 6.5%, the Environment Factor of 5.8%, and the Measure Factor of 3.9%.
2. The findings of PT XYZ's OHS audit non-conformance results can be reduced in the 2021 and 2022 periods, PT XYZ carried out several OHS performance improvements in the following way:
   a. Carry out changes and additions to the OHSMS Internal Audit Implementation Flow by adding the process of making an audit checklist and preparing an Analysis of Internal Audit results
   b. Assigning senior managers to be actively involved in aspects of OHS management because it is very important for the company's business continuity
   c. Develop a more effective and mature management review strategy so that it can be implemented comprehensively
   d. Accelerate the evaluation of HR needs so that additional work personnel can be recruited immediately if needed
   e. Increase the number of personnel to carry out work contracts in detail in fulfilling OHS aspects
3. Recommendations for the OHS Program are carried out by PT XYZ so that all findings from the OHS audit non-conformance results can be followed up. The OHS program recommendations are as follows;
   a. OHS Management System Training and Refreshment Program for all employees at PT XYZ
   b. OHS Inspection Program periodically 1 time per month by the head of the relevant work unit
   c. Monitoring and Evaluation Program of Work procedures that are carried out periodically in accordance with the latest standards and conditions

d. Routine work equipment certification program in accordance with regulations
e. OHS Promotion Programs such as socialization, education, knowledge sharing, and installation of OHS *flyers*, posters, and banners
f. Program for installing OHS signs in every activity that has the risk of a work-related accident
g. Hazard identification and risk assessment program in every work activity at PT XYZ
h. The OHS management meeting program is conducted once per month regularly
i. The OHS management review meeting program is held annually

Evaluation of PT XYZ's OHS management system that has been implemented in this study has had a positive impact on PT XYZ which was before improvements were made to the OHS management system, the number of work-related accidents (LTI and Non-LTI) was very high and after improvements to the OHS management system, the number of work-related accidents (LTI and Non-LTI) has decreased in the last 2 years, i.e. the 2021 and 2022 periods. Improvements to the OHS management system also have a positive impact on the number of OHS audit non-conformance findings, which has decreased in the 2021 and 2022 periods when compared to the period before it was carried out improvement, i.e. the period from 2016 to 2020.

PT XYZ is advised to give an obligation to every employee to be able to understand and apply Fishbone Diagram, 5 Whys, and 5W+1H analysis so that every worker can find the root causes of problems found in the workplace and the best solutions to be implemented to improve the company's performance in terms of reducing cases of LTI and Non-LTI work-related accidents, reducing OHS non-conformance findings in audit results, and following up directly on OHS non-conformance findings, as well as increasing the overall score of OHSMS. In addition to this, PT XYZ is advised to take the following corrective actions:

1. Carry out executive safety leadership training regularly to increase managers' awareness and knowledge in implementing OHS aspects in every work activity.
2. Carry out routine management walkthrough specifically on OHS aspects to observe whether the OHS aspects have been implemented properly in each work process.
3. Carry out OHS refreshment training for all employees regularly at least 1 time per year to increase employee competency and awareness regarding the importance of OHS.
4. Implementing rewards and punishments related to OHS aspects to encourage workers to apply OHS culture while carrying out their work.
5. Carry out OHS program evaluation periodically and continuously (sustainable)

REFERENCE

[1] Anshari, L.H. (2014). Safety Program Implementation Relationship And Occupational Health With Incident Of Diseases Work On Employees Of PT Lembah Karet Padang City In 2014. Fakultas Kedokteran Universitas Gajah Mada Yogyakarta (2014).

[2] Arafat, Y. & Kartadipura, R.H. (2018). Factor Analysis Of OHS Management Implementation On Cost Performance Of Construction Project Implementation. Jurnal Teknologi Berkelanjutan (Sustainable Technology Journal) Vol. 7 No. 1 (2018) pp. 16-25.

[3] BPJS Ketenagakerjaan Republik Indonesia (2021). Laporan Tahunan Terintegrasi 2020.

[4] Çalışa, S. & Küçükalib, U.F. (2019). The Work Safety Culture as a Subculture: The Structure of Work Safety Culture in Turkey. Procedia Computer Science 158 (2019) 546–551.

[5] Delfani, G., Ruseng, S., & Jafar, N. (2018). Implementation Of Occupational Safety And Health Management System Of PT Pelindo IV (Persero) Terminal Petikemas Makassar In 2018. Jurnal Kesehatan Masyarakat Maritim. Vol. 1 No. 3: Agustus 2018. DOI: https://doi.org/10.30597/jkmm.v1i3.872.

[6] Erni, N. & Wijaya, A.S. (2017). Improvement Of Occupational Safety And Health Using Fault Tree Analysis Method And 5W1H At PT Homeware International Indonesia. Jurnal Inovisi Volume 13 Nomor 1, April 2017.

[7] Ferial, R.M. (2020). Application Of Occupational Safety And Health In Efforts To Prevent The Spread Of The Covid-19 Virus In Work Area PT Semen Padang. JESS (Journal of Education on Social Science) Volume 4 Number 2, October 2020, pp. 271-284. DOI:https://doi.org/10.24036/jess.v4i2.

[8] Hämäläinen, P., Takala, J. & Kiat, T. B. (2017). Global Estimates of Occupational Accidents and Work-related Illnesses 2017. Workplace Safety and Health Institute. Singapore.

[9] Handoko, D., Sunaryo, S., & Soedarso, I. (2014). Analysis Of The Influence Of Occupational Safety And Health On Workers Of The Ministry Of Public Works. Jurnal Konstruksia. Vol 5, No 2 (2014). DOI : https://doi.org/10.24853/jk.5.2.%25p.

[10] Hendri (2012). Analysis of the Level of Implementation of the Dan Safety Management System GOKPL Company's Occupational Health in Repressing Numbers Accidents in Oil and Gas Exploration Activities. Fakultas Kesehatan Masyarakat. Universitas Indonesia. Depok (2012).

[11] Hutagalung, A.O. & Ikatrinasari, Z.F. (2018). Influence Of Occupational Health And Safety And Working Discipline On Cleaning Service Employee Performance PT X In Jakarta (Case Study at XYZ Eye Hospital). Jurnal Inkofar. Volume 1 No. 1, Juli 2018.

[12] International Labour Organization (2011). OSH Management System : A Tool For Continual Improvement.

[13] Kusna, N.I. & Mayasari, I. (2015). Analysis Of The Influence Of Foreman Performance On Quality Construction Projects In The City Of Surabaya. Dearsip, Vol. 02 No. 01.

[14] Marthinus, A.P., Manoppo F.J., & Lumeno S.S. (2019). Safety Management System Implementation Model And Occupational Health In Infrastructure Projects Manado – Bitung Toll Road. Jurnal Sipil Statik. Vol.7 No.4 April 2019 (433-448).

[15] Nugroho, R.E. (2022). Implementation Of Continued Improvements Quality Management System At Ptz Company. Journal of Positive School Psychology. Vol. 6, No. 3, 3912 – 3928.

[16] Peraturan Pemerintah Republik Indonesia (2012). Peraturan Pemerintah Nomor 50 Tahun 2012 Tentang Penerapan Sistem Manajemen Keselamatan dan Kesehatan Kerja

[17] Pratiwi, A.D. (2012). Analysis Of Influence Factors Unsafe Action (Unsafe Act) On Workers At PT X In 2011. Fakultas Kesehatan Masyarakat Universitas Indonesia 2011.

[18] Purwanto, A.H.D. & Hartono, S. (2022). Project Performance Through an Occupational and Health Safety Management System at an Office Building Project in Lampung Indonesia. Jurnal Manajemen Teknologi. 21(2), 2022, 166-187. DOI: http://dx.doi.org/10.12695/jmt.2022.21.2.4.

[19] Roharto, T. & Kasmir (2017). Influence Of Occupational Safety Health And Environment And Training On Performance At PT Pelabuhan Indonesia II (Persero) Jakarta (Case Study On Dredging Projects Development of TPK Kalibaru). Jurnal SWOT, Volume VII, No 1, Januari 2017.

[20] Serrat, O. (2009). The Five Whys Technique. Knowledge Solutions. Asian Development Bank (2019).

[21] Siahaan, T., Saleh, S.M. & Ranic, H.A. (2019). Health and Safety Management System Implementation (HSMS) (Case Study On Preservation And Projects Widening Of Takengon City Road – SP. Yellow – Uwaq). Jurnal Arsip Rekayasa Sipil dan Perencanaan 3(1), 61-69 (2020). DOI : https://doi.org/10.24815/jarsp.v3i1.13465.

[22] Susanto, E. (2017). Influence Implementation Of Safety Programs And Occupational Health On Productivity Employee At PT Nestle Indonesia Pabrik Panjang Bandar Lampung. Fakultas Ekonomi dan Bisnis Universitas Lampung Bandar Lampung (2017).

[23] Sutrisno, A., Rahmat A., & Kadir, Y. (2019). Analysis Of The Effectiveness Of Implementation Of Occupational Health and Safety Programs in Construction Projects (Case Study : PT Indorama Jatiluhur Purwakarta's Textille Factory Project). Jurnal Techno Sosio Ekonomika (Edisi Khusus) Universitas Sangga Buana YPKP. pp. 80-96. ISSN 1979-4835.

[24] Qurbani, D. & Selviyana, U. (2018). Effect Of Occupational Safety And Health On Employee Performance At PT Trakindo Utama BSD Branch. Jurnal IMF (Jurnal Ilmiah Manajemen Forkamma), Vol.1, No.3, Mei 2018 Hal : 110 – 129.

[25] Wiyasa, I.W., Putera I.G.A.A., & Nadiasa M. (2015). Occupational Health and Safety Risk Management In The Project Ciputra World Development, Jakarta. Jurnal Spektran. Vol. 3, No. 1, Januari 2015. DOI : https://doi.org/10.24843/SPEKTRAN.2015.v03.i01.