

# Analysis of Safety At Work Supervision, Knowledge, Training, and Personality Case PT. Pertamina, Indonesia

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*“Challenges of Creative and Innovative Management”*

## **Analysis of Safety at Work Supervision, Knowledge, Training, and Personality : Case PT. Pertamina, Indonesia**

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### **Abstract**

Recent challenges such as globalization, a knowledge-based economy, and technological evolution, the people are becoming valuable assets and can be recognized within a framework of human capital. Human is the most important factor, performance and increase their productivity, employers must comprehend worker’s safety safe workplace. Safety at work is crucial and important for keeping workers in a safe condition. Those antecedents and analysis are: supervision, knowledge, training, and personality. The questionnaire is a method that collects the data by using written a set of questions related to the research topic which respondents. The total respondents from this research are 170 respondents. The respondents are those who are working on the production line that has a higher risk of an accident. This research use multiple regression analysis to predict the dependent variable two or more independent variables are the predictor and SPSS 20 as data process tools to calculate and identify the results. PT. Pertamina RU IV Cilacap should train employees to avoid work accident and allow employees to develop new techniques that the employees could increase their emotional stability, safety and personality.

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Keywords: *Human Capital, Safety, Workplace, Training, Knowledge, Personality*

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## INTRODUCTION

### A. Research Background

Injuries, fatalities, and safety at work issues have long been a concern to organizations (Buck, 2011). Organizations have been challenged to meet the regulation of the Indonesian Law No. 1 of 1970. International Labour Organization (2016) discovered that, "in the world every 15 seconds, a worker dies from a work-related accident. Every 15 seconds, 153 workers suffer from a work-related accident. Every day, 6,300 people die suffering from accidents and more than 2.3 million deaths per year". In Indonesia, work accident increases every year (Ashari, 2015). Based on Jamsostek in 2012 in Supriadi (2014), "there were around 103.000 accident cases and nine workers died in average each day". Another work-related injury and accident case that happened in Indonesia is three workers died and four others injured at Pertamina Cilacap in 2011 when workers cleaned the refinery. One of the workers explained that his team was focusing on cleaning the refinery that was filled with crude oil last night. Then suddenly they fell into the refinery when they cleaned it (Saldy, 2011). This means that safety at work is crucial and organization should be more concern with this issue. Looking at the huge number of work-related accidents and fatal accident issues like the Pertamina Cilacap case, this research wants to identify why such work-related accident occurs at Pertamina Cilacap and what are the antecedents that may have positive regression towards safety at work.

Safety at work is crucial and important for keeping workers in a safe condition. There are four antecedents that this research believes will have a positive impact towards safety at work. Those antecedents are: supervision, knowledge, training, and personality. From the Pertamina Cilacap case, supervision, knowledge, and training maybe one of the factors that cause an explosion. At that time, the worker was alone and no one was there monitoring on him. His supervisor should have been there inspecting on him and his work performance and looking at some mistakes that he may have made. His supervisor could also check his sound pressure

while he blasts it on the refinery. Another supervision fatality case is the crane that falls in Mecca in 2015. The crane killed 107 people and 238 others suffered injuries (Karimi et al., 2015). Even though it wasn't totally the supervisor's fault, but in my opinion the supervisors should be aware of the crane's location because it is near to the Grand Mosque. Supervisors should ask workers to put the cranes in a safe place after work, so no one gets injured.

### B. The Formulation of Research Problem

Pertamina Cilacap targeted zero accident in 2015 (Abdulrahman, 2015). Several procedures have been done by supervising contractors about safety at work procedures and implementing health and safety procedures much better (Abdulrahman, 2015). But just two months after the zero accident statement, a refinery exploded that killed a worker. This worker was cleaning the refinery with sand blasting method (cleaning the refinery surface with high-pressure sound) that caused friction to the refinery and exploded (Ruli, 2015) and (Duta, 2015).

The opening case is also an example of work-related accident case that happened at Pertamina Cilacap. Other sources explained that those workers who died did not just fell off into the refinery, they also inhaled poison gas (Andrianto, 2011). One of the survived workers explained that they fell into the refinery and accidentally inhaled the poison gas (Andrianto, 2011) and (Saldy, 2011).

Based on the above explanation, the research problem questions can be formulated as below:

1. Does supervision have a positive impact towards safety at work?
2. Does knowledge have a positive impact towards safety at work?
3. Does training have a positive impact towards safety at work?
4. Does extraversion have a positive impact towards safety at work?
5. Does agreeableness have a positive impact towards safety at work?

### C. Research Scope

By looking at those accident cases that occur at Pertamina Cilacap, this research focuses on identifying the antecedents of safety at work. By developing the antecedents or factors from

previous researches, this research wants to discover whether those antecedents have positive regression towards safety at work.

#### D. Research Objectives

The objectives of this research will be divided into two types. Both types of objectives will be mentioned as follows:

##### 1. General Objective:

Identify what are the antecedents that may have positive regression towards safety at work.

##### 2. Specific Objective:

- a. To analyze the regression between supervision towards safety at work.
- b. To analyze the regression between knowledge towards safety at work.
- c. To analyze the regression between training towards safety at work.
- d. To analyze the regression between extraversion towards safety at work.
- e.

#### LITERATURE REVIEW

##### A. Literature Review

###### 1. Safety at Work

Workers are the most important component in any organization. A theory from Cobb and Douglas in Huggett (2015) stated that "organizations mainly consist of human capital". According to human capital consist of facilities and equipment with the production system. Although these components are important, the human is the most important factor, because the human has self-ability to do. They kept organizations running. To keep workers, stay at their best performance and increase their productivity, employers must comprehend about their worker's safety and also provide a safe workplace. Safe workplace could provide consistency and reliability to grow a business (OSHA, 2015). According to Nik (2012) the term safety refers to "condition of avoiding hurt, injury, or loss". This is the most crucial factor that could affect job satisfaction.

Safety is one of the five hierarchy of needs mentioned by Abraham Maslow. Safety is classified as lower order needs. What means by low order needs are needs that have to be fulfilled first before other needs. When employees work, they first want to satisfy their physiological needs first,

like hunger, thirst, shelter, etc. The second need is safety. Safety is needed so workers could avoid from threats and secure their physical and emotional environment (Daft and Lane, 2008) and (Robbins and Judge, 2013). Safety these days are a bit difficult to achieve. Lots of accident issues happened these days. Workers falling from a high building, injured during working hours, or disobeying safety regulation are the examples of safety accident issues. Those work-related accidents examples cause serious problems in any organization and place huge costs on industry and also for the nation (Ali et al., 2009).

##### 2. Supervision

Supervisors has several roles in the working team. Supervisors could act as a coach, trainer, referee, cheerleader, and captain. The term coach and trainer means that supervisors should train their employees to follow the health and safety regulation and standards, they also can train them to use proper safety tools, and be aware of danger. On the other hand, the terms of the referee, cheerleader, and captain means that supervisors could rebuke when they are acting as a referee, they also could cheer their employees when they act as a cheerleader, and lead them to the safe working environment when they act as a captain (Work Safe Victoria, 2015). Another important role is they can act as an advisor. Safety advisor has three potential roles: expert, coordinator, and controller (Cameron et al., 2013). Each of those roles are implemented base on a particular situation.

Conducting supervision is compulsory for every organization because safety supervisions are designed

to examine a specific area of the organization, to locate and define any faults in the systems, equipment, plants or machines, or any operational errors that might harm workers or be the source of accidents (Armstrong and Taylor, 2014). Another reason why supervision is important is because it can enhance worker's professional skills, knowledge, and attitudes in order to achieve competency in providing quality care (Hughes, 2010). Supervision also teaches supervisors to care with other workers because supervisors are also workers. As a human, we have to take care of each other and try to protect each other (Lambley, 2013). Without supervision, cases like the Puslabfor tragedy or the refinery explosion tragedy at Pertamina Cilacap that was mentioned in earlier is a good example of bad supervision or lack of supervision. Just imagine how it would be like a workplace without supervision. Much more employees will lose their lives. This is why supervision is important.

*a. Advice workers about hazards and dangers and responding to their concerns*

Supervisors are the one who are responsible to take action when dangerous or hazardous situation might come. Every supervisor must be aware about these things and take corrective actions and has to make quick decisions before it is too late. Listening to an employee's complaint about things that may danger them are also very important. From the employee feedback or complaints, supervisors know what's the real situation that may danger their workers (Work Safe Victoria, 2015). But sloppy things might occur, especially when they delay to take corrective actions. Like in Indonesia, foreman in the construction area usually late when taking corrective actions, other supervisors like in the mining field or any other situation that are dangerous for workers, usually take corrective actions when an incident has happened. They would not take the corrective action before anything happened, because they think that everything is going to be alright.

*b. Ensure workers wear and use the right protective equipment*

Safety equipment is also vital keeping workers in a safety condition. Supervisor's job is to make sure that every worker wears the right protective equipment like safety helmet, safety jacket or safety vest, life jacket (for workers working offshore or at sea), and other safety equipment that is compatible for the job. Some supervisors may think that these are just simple equipment, but it has a big advantage if workers wear it (Work Safe Victoria, 2015).

*c. Showing workers how to work safely and make sure they follow the law, and the workplace health and safety procedures*

Supervisors are also coach or mentor as it was mentioned at the beginning of this section. Teaching things and sharing knowledge and skills to employees are necessary. When workers want to be safe and when organizations want less or even zero accident cases, they have to look at the supervisor. Supervisors are those who teach new things, inform workers what to do, and notify workers what criteria they should fulfill. Workers could not do that without supervisor's assistance. Good supervisors are those who share their knowledge and skills to their subordinate (Work Safe Victoria, 2015).

*d. Reviewing employee's deaths, injuries and illnesses*

Knowing that their subordinates are fine and healthy is very important. Supervisors should also know about their subordinate's deaths, injuries, and illnesses record. It can help supervisors monitor their subordinates and give more attention to those who has the most injuries or illnesses record. Using the injury form from OSH can help supervisor record employee's deaths, injuries, and illnesses (Work Safe Victoria, 2015) and (OSHA, 2015).

### **1. Knowledge**

Every worker learned new things every day. From learning how to face problems until learning how to find solutions for those problems. For example, Jay read a book about how to face an injury at work. From the book that he read, he then applied it at work. When an injury occurs at his workplace, he helped his injured friend with his first aid actions that he learned from the book. From the example, what Jay have learned are called knowledge.

Knowledge exchange is a fast way to spread information to another work colleague. By using knowledge sharing in knowledge exchange systems, it can create creative solutions (Carmeli et al., 2013) that is also important for creating a safe workplace. Employees need creative ways to solve problems when an accident occurs or when needed. Creative problem solving ideas can bring new innovations to the company for further development if needed.

There are several benefits for organization using knowledge management:

- a. Enabling better and faster decision making.

Knowledge management spread and gather information to the whole organization (Greenberg and Baron, 2003). Faster decision making could occur because knowledge management is an effective way to spread and gather information faster (Garfield, 2014). Top managements could surf the database and search the information that they need (Laudon and Laudon, 2012). For example, QWERTY Company want to terminate their employees to save company's money, they could search for less productive employees from their absenteeism or another past record.

- b. Fully accurately informed employees.  
Accurate information is very critical in knowledge management, why? Miss communication could lead to fatal accidents. Careless workers are an example of miss communication. Careless workers may not focus when instructions are given to them and the result is they do sloppy things like carrying heavy properties alone or cleaning the window without safety equipment. Using knowledge management, workers could share and also remind others about the given information or tell them to browse the database to get clear instruction. This is how knowledge management could spread accurate information to employees (Bounds, 2009).

## 2. Training

Safety is an important aspect in every workplace. Every organization wants to create a safe workplace and avoid from work accidents. Frontrunner companies in health management regard health as a strategic asset, the motor of development and innovation, and as a resource contributing to the achievement of business

targets (Zwetsloot et al., 2010). The health and vitality of the workforce are seen as strategic resources that need development rather than assets that primarily require protection (Hansson et al., 2007). This is where safety training plays its role, before explaining further about training, what is actually training? A couple of authors defined training differently. (Noe, 2010) Defined training as a planned effort by a company to facilitate employees learning job competencies such as knowledge, skills, or behavior that are critical for successful job performance. Based on (Dessler, 2013) training refers to the process of teaching new or current employees the basic skills they need to perform their jobs. (Gomez-Mejia et al., 2012) explained that training is the process of providing employees with specific skills or helping them to correct deficiencies in their performance. In a simple explanation, training could be defined as developing and learning skills and competencies for work.

## B. The Formulation of Research Model

### 1. Research Framework and Hypothesis

From previous research, organizations want to minimize the resulting loss and damage to people and property (Armstrong and Taylor, 2014) that can provide a safety workplace. The major problem that causes workplace injuries are poor usage and handling of tools and machinery (Ali et al., 2009) and organizations want to prevent from those factors to create a safe workplace area. Previous researchers suggested that supervision (Armstrong and Taylor, 2014), (Dessler, 2013), and (Work Safe Victoria, 2015), knowledge (Gressgard, 2014) and (Hoss and Schlusel, 2009), training (Tofte, 2011) and (OSHA, 2015), personality (Stuhlmacher et al., 2009) and (Buck, 2011) could prevent from those major problem that causes workplace injuries are poor usage and handling of tools and machinery that was mentioned by (Ali et al., 2009) and other work-related accidents.

### H1: Supervision positively regress with safety at work

- a. Effect of knowledge towards safety at work

Knowledge is also an important factor that can improve safety or prevent from injuries at

work. When someone gets knowledge about safety knowledge for example like preventing from an injury, they can apply this knowledge in a working environment (Wardani, 2011). In the Undang-Undang Republik Indonesia No. 1 of 1970 Chapter 5 Article 9 verse 1 (Lestari and Effendi, 2005) stated that employers should explain and present to fresh employees about:

- 1) Conditions and dangers that could appear in the workplace;
- 2) All safety and protection tools that are compulsory in the workplace;
- 3) Protection tools for the employee itself;
- 4) Safety attitudes during work.

All four antecedents that were mentioned in the Undang-Undang Republik Indonesia No. 1 of 1970 Chapter 5 Article 9 verse 1 was all knowledge to prevent from work-related accidents.

## **H2: Knowledge positively regress with safety at work**

### **b. Effect of training towards safety at work**

When an employee sees an accident and immediately bring the needed tools to help his or her friends, this means that this employee is well trained. For an employee to be well trained, training is compulsory. As mentioned earlier in this chapter, *Occupational Safety and Health Act of 1970* stated that “employers are responsible for providing a safe and healthful workplace and no person should ever have to be injured, become ill, or die for a pay check” (OSHA, 2015). Also explained in the Undang-Undang Republik Indonesia of 1970 Chapter 5 Article 9 verse 3 stated that “employers are required to organize training for all workers under their lead, in preventing accident and increasing health and safety at work, also in giving first aid help during an accident” (Lestari and Effendi, 2005).

Previous researchers also found that health and safety training is a key part of the preventive program (Armstrong and Taylor, 2014). Health and safety training could also address safety and health responsibilities of all personnel (Buck, 2011). Health and Safety Executive (2015) also found that by training, it can help employees learn how to do something,

telling them what they should do or should not do, or simply give them information.

This shows that how training is compulsory and how training could prevent workers from an accident.

## **H3: Training positively regress with safety at work**

### **c. Effect of personality towards safety at work**

We sometimes hear in the news or read in the newspaper that a truck or a delivery car crashed during their journey to deliver a package or goods to a customer or a retailer. Drivers are sometime too confident or too optimistic about their driving skills, so they take risky actions like not taking a rest after a long drive, and this could cause accident (Seibokaite and Endriulaitiene, 2012). Seibokaite and Endriulaitiene (2012) also explained that optimism is a type of traits in extraversion and usually found to be positively correlated with risk-taking behaviour. Other research as mentioned above also found that extraversion, conscientiousness and openness to experience were related to at-fault accidents (Stuhlmacher et al., 2009) and (Buck, 2011).

## **H4: Extraversion positively regress with safety at work**

## **H5: Agreeableness positively regress with safety at work**

## **H6: Conscientiousness positively regress with safety at work**

## **H7: Emotional stability positively regress with safety at work**

## **H8: Openness to experience positively regress with safety at work**

Based on previous explanation, the research framework can be described as follows:

## **Figure 2.8 Framework Model**

## **RESEARCH**

## **METHODS AND DATA ANALYSIS TECHNIQUES**

## A. Research Method

### 1. Research Type

We have seen several pieces of evidence above from previous researches that studied the relationship between supervision, knowledge, training, and personality towards safety at work. This research is a causal study that will observe the relationship between the independent variables (supervision, knowledge, training, and personality) toward the dependent variables (safety at work).

### 2. Research Object

The research object of this study is PT. Pertamina RU IV Cilacap. Pertamina RU (Refinery Unit) IV is Pertamina's branch company in Cilacap.

### 3. Population and Sample

The population of this are all of the Pertamina Cilacap employees that are working outside the office desk (technician, manufacturing, etc.). This research will use Slovin's Sample Formula (Putra, 2012):

$$n = \frac{N}{1 + Ne^2}$$

$$= \frac{800}{1 + 800(0.05^2)} = 267 \text{ (rounded)}$$

Note:

n = Total sample

N = Total population

e = Error tolerance

### 4. Source and Type of Data

This research uses primary data. Primary data is a data that is collected by the researcher or someone who conduct the research. The source of the data will be collected directly from Pertamina Cilacap and browse from the company's official website.

### 5. Collected Data Method

The method of collecting the data for this research will use these steps mentioned below:

- a. Prepare the questionnaire (from previous studies)
- b. Collect the data from the sample
- c. Analyze the data
- d. Draw the result

The data of this study are collected by using the following methods as mentioned below:

#### 1) Questionnaire

Questionnaire is a method that collects the data by using written set of questions related with the research topic which respondents has to fill their answers in the answer sheet (Sekaran, 1984:145). The questionnaire will use 5 Likert scale. 5 Likert scale is an interval scale that measure the questionnaire from 1 to 5 (Sekaran, 1984:132). 1 measures strongly disagree and 5 measure strongly agree. This questionnaire has to be filled by the Pertamina Cilacap workers.

#### 2) Sampling

This research will use convenience sampling. This sampling technique collect information from the population who are easily available to provide the information for the questionnaire (Sekaran, 1984:189). Convenience sampling is used for this research is because it the workers at Pertamina Cilacap are working on a shift and a tight schedule, so it is impossible to randomize them. That's why Pertamina Cilacap has agreed to find the available workers for the samples.

## 6. The Conceptual and Operational Definition of Variables

- a. Dependent Variable (Y) is Safety at Work measured by frequency rate and incidence rate.

1) Conceptual definition: Safety is a condition of avoiding hurt, injury, or loss (Nik, 2012).

2) Operational definition: Safety is referred as employee's erudition towards safety components and safety rules. Safety components are classified into three, which are:

- a) Tools: Tools are the equipment that makes the job easy for the workers. In the questionnaire, tools are represented in Q2, Q3, Q4, Q6, Q11, and Q16.
- b) Chemical Substances: Chemical substances refers

- to a chemical composition that could danger employee's safety. In the questionnaire, chemical substances are represented in Q7, Q8, Q9, and Q13.
- c) Knowledge: Knowledge are skills and ability that workers have from previous training or information that they have received (Greenberg and Baron, 2003). Knowledge are represented in Q1, Q5, Q10, Q12, Q14, and Q15.
- b. Independent Variables (X) are:
- 1) Supervision
    - a) Conceptual definition: Supervision refers to a key component of an employer's general duty of care (Work Safe Victoria, 2015).
    - b) Operational definition: Supervision is monitoring employee's activity and assisting employees. Monitoring and assisting are the indicators for supervision.
      - i. Monitoring: Monitoring refers to seeing and checking employee's activity. Monitoring is represented in Q2 and Q5.
      - ii. Assisting: Assisting refers to helping and providing employees work support. Assisting is represented in Q1, Q3, Q4, and Q6.
  - 2) Knowledge
    - a) Conceptual definition: Knowledge or knowledge management is defined as the process of gathering, organizing, and sharing a company's information and knowledge assets (Greenberg and Baron, 2003).
    - b) Operational definition: Knowledge refers to seeking and sharing information thru people or culture, process, and technology.
      - i. People or Culture: People or culture are those who seeks and share information and how information are spread and found (Hoss, Rob and Art Schlüssel, 2009). Different people with different culture respond and share information differently. Culture of collaboration, communities of Practice (CoP), face to face/brown bag meetings, online suggestion box, capture knowledge of key retiring or departing employees, and chief knowledge officer (CKO) represent the people/culture indicator.
      - ii. Process: Process is how information are gathered and shared. Effective processes represent the process indicator.
      - iii. Technology: Technology is the tool to seek and share knowledge. Repository/content management system and search.

## 3) Training

- a. Conceptual definition: The term training refers to learn how to do something, telling them what they should do or should not do, or simply give them information (Health and Safety Executive, 2015).
- b. Operational definition: Training is increasing skills or expertise at work. Needs and intimacy are the indicators for training.
- iii. Needs: Needs are what employees achieve after they joined the training program. Needs are represented by questions number 1, 2, 3, 4, 5, 6, 9, 10, and 11.
- iv. Intimacy: Intimacy is a behavior that makes employees feel close with the company after the training program. Intimacy is represented by questions number 7, 8, and 12.

## 4) Personality

- a) Conceptual definition: Personality is defined by Gordon Allport in Robbins and Judge (2013) as “the dynamic organization within the individual of those psychophysical systems that determine his or her unique

adjustments to his or her environment”.

- b) Operational definition: Personality is the different traits that each individual has. These traits are extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience

- i. Extraversion: Extraversion is the degree to which a person is outgoing, sociable, talkative and comfortable to new people (Daft and Lane, 2008:98) and (Robbins and Judge, 2013:170). Extraversion is represented by “I am usually the life of the party”, “I feel comfortable around people”, and “I am talkative”.

- ii. Agreeableness: A person who is able to get along with others by being good-natured, comparative, forgiving, compassionate, understanding, and trusting is agreeableness (Daft and Lane, 2008:99) and (Robbins and Judge, 2013:170). In the questionnaire, agreeableness is represented by “I am kind and sympathy”, “I have a good work for everyone”, and “I never insult people”.

- iii. Conscientiousness: Someone who is responsible, dependable, persistent and organized is defined as conscientiousness (Robbins and Judge, 2013:170) and (Daft and Lane, 2008:100). Conscientiousness is represented by “I am systematic and efficient”, “I pay attention to details”, and “I am always prepared for class” are the questions for conscientiousness.

#### B. Data Analysis Techniques

This research will use multiple regression analysis and SPSS 20 as data process tools. The SPSS 20 software will help this research to calculate and identify the results of this research. This research uses multiple regression analysis. Multiple regression is used to predict the dependent variable if two or more independent variables are as the predictor (Sugiyono,

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{[n(\sum x^2) - (\sum x)^2][n(\sum y^2) - (\sum y)^2]}$$

2012:275) and (Gujarati, 2003:203). The minimum number of the independent variables are two independent variables in multiple regression (Sugiyono, 2012:275). The formula is as below:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e$$

Where:

Y = Dependent variable

a = Constant

b<sub>1</sub> until b<sub>4</sub> = Regression

coefficient of independent variable

X<sub>1</sub> = Supervision

X<sub>2</sub> = Knowledge

X<sub>3</sub> = Training

X<sub>4</sub> = Personality

e = Residual

### 1. Hypothesis Testing

#### a. T Test

T-test is used to test the relationship between the independent variables (supervision, knowledge, training, and personality) with the dependent variable (safety at work) (Suliyanto, 2011: 62) and (Douglas et al., 2012:527). The formulation is as below:

$$t_i = \frac{b_j}{Sb_j}$$

Notes: = Value of t

t<sub>i</sub> = statistics

b<sub>j</sub> = Regression coefficients

Sb<sub>j</sub> = Standard deviation

### 2. Coefficient of Determination (R<sup>2</sup>)

Coefficient of determination testing is used to find out how far the ability of models to explain variation in the dependent variable (Hamidah, 2015:46) and (Douglas et al., 2012:521). But before we identify the R<sup>2</sup>, we have to find the regression coefficient first (r). The formula is as below (Andale, 2012):

note

*r = Correlation coefficient*

$$\sum xy = \text{Total } x \text{ times } y$$

$$\sum x = \text{Total } x$$

$$\sum y = \text{Total } y$$

*n = Number of sample*

### 3. Multiple Standard Error of Estimate

Multiple standard error of estimate is a measure of the dispersion of the observed values around the regression line and utilizes squared deviations from the regression line (Douglas et al., 2012:521). The formula is as below:

$$S_{Y.1234} = \sqrt{\frac{\sum(Y - \hat{Y})^2}{n - (k + 1)}}$$

Note:

S<sub>Y.1234</sub> = Multiple standard error of estimate

Y = Actual observation

$\hat{Y}$  = Estimated value computed from the regression equation

n = Number of observations in the sample

k = Number of independent variables

## RESULTS AND DISCUSSION

### A. General Description of the Study

This study was taken at PT. Pertamina RU IV Cilacap. Pertamina RU IV is Pertamina's branch company that is located at Cilacap. This branch company help Pertamina to produce and distribute their final product. They cultivate the crude oil into subsidized oil, non-subsidized oil, and petrochemicals (Pertamina, 2012).

PT. Pertamina RU IV Cilacap has the biggest oil production compared with the other six branch company. It could produce 348,000 barrels per day and has the most complete facilities (Pertamina, 2012). PT. Pertamina RU IV Cilacap could supply 34% national needs or 60% Java Island needs (Pertamina, 2012).

### B. Data Analysis

#### 1. Hypothesis Testing

This research uses T-test to test its hypothesis as it was mentioned in the previous section. From the result using the SPSS 20 software, this result found that only two variables that are correlated positively with  $\alpha 0.05$  and t tabel 1.975 (n-k).

From the result, this research has proved that only supervision that has a positive impact towards safety at work. This occurs because at PT. Pertamina RU IV Cilacap supervisors has a huge role in making their subordinates safe from danger. Most of the respondents are satisfied with their supervisor's role. They also have a strong

relationship with their supervisors. This is why that supervision has a positive and significant relationship with safety at work. This means that H1 is supported. Whereas knowledge, training, extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience does not have a positive impact towards safety at work. Knowledge does not positively regress with safety at work because there are some individuals who only receive the given knowledge but they did not put it into action. Even though the culture of collaboration or the way the information is spread good or most of the respondents agree, but some of the individuals only receive the information but they do not apply it. This means that H2 is not supported.

Training also does not have positive regression towards safety at work. From the above result, t statistics is smaller than t table. This occur because some of the respondents are not satisfied with the training system at PT. Pertamina RU IV Cilacap. Some of the respondents also complaint that the training is boring and is not conducted continuously. This is why that training does not have positive relationship with safety at work. This means that H3 is not supported.

Extraversion regress negatively significant towards safety at work. In this research, extraversion is represented by the question "I am usually the life of the party", "I feel comfortable around people", and "I am talkative". For the "I am usually the life of the party" statement, most of the respondents answer neutral which mean that they neither agree nor disagree with the statement. For the other two statements "I feel comfortable around people", and "I am talkative", in average the respondents answer 4 (rounded) for "I feel comfortable around people", and 3 (rounded) for "I am talkative". From the average answer of the respondents, extrovert worker may react slow when an accident occurs because they are too comfortable around people which they tend to follow others and do not have their own initiative when making decision in this particular situation which could lead them to danger. This means that H4 is not supported.

## 2. Coefficient of Determination ( $R^2$ )

After knowing the result from the t test,

next is identifying the Coefficient of

Determination ( $R^2$ ). The result is as below:

Table 4.2 Coefficient of Determination ( $R^2$ ) Result

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.448	0.201	0.161	3.28103

From the above data, the R Square is 0.201. This means that 20.1 percent of safety at work is influenced by supervision, knowledge, training, and personality.

## 3. Multiple Standard Error of Estimate

The result of the Multiple Standard Error of Estimate is as below:

Table 4.3 Standard Error of the Estimate Result

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.448	0.201	0.161	3.28103

From the above data, the diversion between the regression equation with the real dependent value is 3.281 dependent variable denomination.

## C. Discussion

Training and knowledge are related and that is why training also does not have positive relationship towards safety at work. This occurs because employees are bored with the training system at PT. Pertamina RU IV Cilacap explained Mr. Y. As it was mentioned previously, workers only conduct training to complete the objectives from the company, after the training is over, some of them forgot about the technique and some of them do not apply what has been taught during the training session. This is why the result from this research is different with the previous research that found health and safety training is a key part of the preventive program (Armstrong and Taylor, 2014). Buck (2011) also explained

that health and safety training could also address safety and health responsibilities of all personnel. This research agrees with the statement that health and safety training is a key part of the preventive program and could also address safety and health responsibilities of all personnel, but if the training is implemented properly during the real working hours.

There are several other reasons why only one hypothesis that is supported.

- (1) Only 170 questionnaires that can be used from 307 questionnaires that have been spread.
- (2) Most of the respondents are busy when filling the questionnaire, which made them filling it quickly.
- (3) In average, most of the respondents answer neutral which is hard for the researcher to draw a conclusion.
- (4) Most of the respondents are bored with questionnaire forms as Mr. Y from HSE Department, Mr. X and Mrs. Z from Public Relation (PR) Department, and Mrs. W from Human Resource (HR) Department explained to the researcher.
- (5) More than 50 percent of the respondents filled the questionnaire randomly.

The table below summarizes the supported and not supported hypotheses:

Table 4.4 Summary of Hypotheses Analyse

Hypotheses	Significant Value	Information
1	$sig. (0.006) < a(0.05)$	Supported
2	$sig. (0.141) < a(0.05)$	Not Supported
3	$sig. (0.509) < a(0.05)$	Supported Not
4	$sig. (0.004) < a(0.05)$	Supported Not
5	$sig. (0.006) < a(0.05)$	Supported Not
6	$sig. (0.071) < a(0.05)$	Supported Not
7	$sig. (0.631) < a(0.05)$	Supported Not
8	$sig. (0.230) < a(0.05)$	Supported

## CONCLUSION AND

### IMPLICATION A. Conclusion

This research found that from the four antecedents (supervision, knowledge, training, and personality), only supervision that has a positive and significant relationship towards safety at work or H1 is supported. Whereas knowledge, training, and personality (extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience) do not have positive relationship towards safety at work or H2 until H8 is not supported. From the result, knowledge, training, and personality also is different from the previous researchers and theories. There are several reasons why the result of this research differs from previous researchers. The main reason is because the respondents are saturated filling the questionnaires, which made the result far from what the researcher expected.

### B. Implication

It is suggested that future research should find better respondents. Future research should look for respondents who are less busy with their job and more enthusiastic respondents, so the result would be more valid. In this research, the respondents have busy and long work hours, which made them have less time to fill the questionnaires. Respondents are also bored with questionnaires, because every couple of month they also have to fill questionnaires from the company. They should also focus on other antecedents, which this research has only focus on four antecedents. This research believes that there are many antecedents besides those four, but in this research the researcher decided to use four antecedents because of the limitations and difficulty to find for more antecedents and better theories. And last, this research also suggest that future study should study more than one company for a better result and could compare the result between companies.

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