

# Relation between Activator Factors and Compliance Behavior of Using Personal Protective Equipment on Technician Workers PT ARPS Surabaya

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# Relation between Activator Factors and Compliance Behavior of Using Personal Protective Equipment on Technician Workers PT ARPS Surabaya

## Hubungan antara Faktor Activator dengan Perilaku Kepatuhan Penggunaan Alat Pelindung Diri Pada Pekerja Teknisi PT ARPS Surabaya

### ABSTRACT

**Introduction:** Equipment that must be used for work safety and safety when working with potential work hazards or accidents (PPE). The purpose of this study was to analyze the factors associated with the use of PPE in the workforce of technicians at PT. ARPS is still lacking in terms of PPE usage. **Methods:** This research is an analytic observational study, with cross sectional design. The subjects of this study were all of the technician workforce in the section of blow molding, maintenance and injection molding by 39 respondents. **Results:** This study shows that activator factors such as perception ( $r = 0.108$ ), knowledge of occupational health and safety ( $r = -0.104$ ), and PPE regulation ( $r = -0.166$ ) have a weak relationship with safety behavior on compliance with PPE implementation. **Conclusions:** The results showed that 43.6% of the workforce behaves poorly in using PPE in the workplace, for the workers in the Blow Molding, Maintenance and Injection Molding unit have a 48% of workers have a enough perceptions, 44.7% of workers have a enough knowledge, and 50% of workers have a enough ability to comply with PPE regulations.

**Keywords:** knowledge, perception, personal protective equipment, policy

### ABSTRAK

**Pendahuluan:** Peralatan yang wajib dipakai untuk melindungi dan menjaga keselamatan tenaga kerja saat bekerja dengan potensi bahaya atau resiko kecelakaan kerja adalah alat pelindung diri (APD). Tujuan penelitian ini adalah menganalisa faktor yang berhubungan dengan perilaku penggunaan APD pada tenaga kerja teknisi di PT. ARPS yang masih kurang dalam perilaku kepatuhan penggunaan APD. **Metode:** Penelitian ini bersifat observasional analitik, dengan desain cross sectional. Subjek penelitian ini adalah seluruh tenaga kerja teknisi pada bagian blow molding, maintenance dan injection molding sebesar 39 responden. **Hasil:** Penelitian ini menunjukkan bahwa faktor aktivator yaitu persepsi ( $r = 0,108$ ), pengetahuan K3 ( $r = -0,104$ ), dan peraturan APD adalah ( $r = -0,166$ ) memiliki hubungan lemah dengan perilaku keselamatan pada kepatuhan dengan penerapan APD. **Simpulan:** Hasil penelitian menunjukkan 43,6% pekerja berperilaku buruk dalam menggunakan APD di tempat kerja, untuk pekerja di unit blow molding, maintenance dan injection molding menunjukkan bahwa 48% pekerja memiliki persepsi yang cukup baik, 44,7% pekerja memiliki pengetahuan yang cukup baik, dan 50% pekerja memiliki kemampuan yang cukup baik terhadap peraturan APD.

**Kata kunci :** alat pelindung diri, kebijakan, pengetahuan, persepsi

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### INTRODUCTION

The development of attention to aspects of occupational safety and health in the industrial sector in Indonesia. This certainly causes a big change in the industrial sector, where industries use more technology both from input, process to output in the form of goods or services. The changes that occur certainly have benefits as well as giving rise to the potential danger of work accidents if not handled and controlled to the maximum.

The incidence of accidents and occupational diseases is 2.78 million workers die

every year (International Labour Organization, 2018). The increase in deaths due to occupational diseases was around 2.4 million (86.3%), while around 380,000 (13.7%) were caused by workplace accidents. In addition to causing untold human suffering, accidents and occupational diseases result in significant economic costs, with an estimated annual loss of 3.94 percent of global GDP. According to (Amir and May, 2018) around 2 million people around the world were laid off from work because they were spared, of which 25% or more increased head, eye, hand and foot injuries. Factors that cause this to happen are lack of knowledge and use of safety equipment.

Seeing the high number of work accidents, a control hierarchy must be made consisting of elimination, substitution, technical control, administrative control, PPE and expanded with welfare and monitoring (Uzun *et al.*, 2018). Risk control through environmental safeguards tools and techniques are things that must be prioritized, but the facts that occur, sometimes work risks can not be controlled. Therefore, the management must provide a solution, one of which is by requiring the use of PPE for the workforce.

PPE is a protective device for workers used to reduce danger. PPE can be interpreted as a tool used to protect themselves from temperature exposure. The use of PPE is an effective measure to reduce the risk of workplace accidents (Tanko and Anigbogu, 2012). Obligations regarding PPE are not only required by companies as providers, but are also required by workers to be obedient in using PPE in accordance with the potential hazards in the workplace. This has been regulated in Minister of Manpower and Transmigration Regulation number 8 of 2010 concerning PPE article 6 paragraph 1. However, the facts contained in the field, the level of compliance using PPE is still low, the factor causing it is the level of perception of labor that considers PPE can interfere with work. Based on research that has been done by (Barizqi, 2015), workers who were not compliant to use PPE caused the workforce (36.4%) had experienced a work accident while falling while working on the project, (42.4%) had experienced a work accident in the form of being struck down or falling down during work in a construction project (18.2%) had a work accident in the form of being pinched, (15.2%) had an accident in the form of a hammer, and (0.33%) had a work accident in the form of a sharp object being scratched, there were even workers who experienced more than one type work accident.

Based on this, an approach is needed to be able to change the behavior of the workforce. The process of changing behavior can be carried out systematically and objectively by identifying and strengthening one's attitude to be able to behave safely in the workplace, as well as manipulating the conditions of the work environment by implementing security, safety and welfare of the workforce. Behavior Based Safety (BBS) is an occupational safety program that focuses on the behavior of safety workers (Safety Behavior) where workers can determine

the tools and procedures that can be used to control individuals to avoid work risks (Geller, 2005). In the approach through behavior (Safe Behavior) conducted by (Guastello, 2013) get good results, which can reduce the level of loss due to accidents by 59.6%, followed by an ergonomic approach of 51.6%, and through an engineering control approach of 29 %.

PT APRS is a company engaged in manufacturing plastic-based as cosmetic packaging products and equipment products for daily needs. The main production process of making packaging on ARPS is done by means of injection of hot plastic (Injection) and blowing of hot plastic dough (Blow Moding) with plastic seed raw material. The routine work of technicians in the Injection and Blow section is to prepare the machine before production (Star-Up), supervise and regulate the machine when in the production process and dismantle and maintain the machine when it is not in production, of course the work has a lot of types of potential hazards both physical and potential hazards chemicals such as electric shock, heat radiation (temperature > 2000C), fire or explosion, noise, crushed, impacted, imprinted by the rest of the mold, and dust exposure. This was exacerbated by workers' not obey with the use of PPE as a factor for unsafe action. Thus, researchers will analyze worker activator factors related with worker compliance behavior with the use of Personal Protective Equipment by technicians in the injection and blow molding section.

The method that can be used to consider a person's behavior is to use the ABC (Activator-Behavior-Consequence) approach (Geller, 2006).

*Activator* is a signal and a supporter of the emergence of a Behavior, Consequence is a thing that follows someone to be able to behave or as a result of the behavior carried out by someone. This principle is used to improve performance in organizations (Geller, 2006) (Wang *et al.*, 2018).

Based on this, identification of the factors that underlie employee compliance in using PPE will be carried out with a behavior-based analysis using the Activator approach. From these factors, it will be known the factors that can influence the workforce to encourage disciplinary behavior in make use of Personal Protective Equipment in the factory for workers at PT. APRS.

## METHODS

This type of research is observational analytic with Cross Sectional research method. Cross Sectional Assessment is a type of research that prioritizes. The independent variables in this study are the variables of knowledge, perceptions and regulations related to PPE, while the dependent variable in this study is the behavior of compliance with PPE.

The study was conducted in November 2017 to April 2018 at PT. ARPS located on Jalan Rungkut Industri IV No.23, Rungkut Tengah, Gunung Anyar, Surabaya City. The population of this study is all workers in PT. ARPS in the blow molding, maintenance and injection molding technicians totaling 39 workers. Sampling in this study is total sampling, which is a sampling technique where the number of samples is equal to the population (Sugiyono, 2017).

<sup>22</sup> This study uses primary data and secondary data. Primary data is obtained through distributing questionnaires from these that have been tested for validity and reliability, conducting in-depth interviews and field observations.. Meanwhile, secondary data is sourced from a number of literatures in the form of company documents regarding SOP policy on the use of PPE, company OSH regulations, company profile and staffing data. The data that has been collected will be analyzed bivariately and univariately. For the results of the analysis of univariate data conducted to see the frequency distribution of data and the percentage of each variable studied is the Activator. The research data that has been processed will then be analyzed using the Spearman correlation test.

## RESULTS

### Activator Factor Component

Activator Factor Components in the study include knowledge of workers about PPE and occupational health and safety (OHS) in general, workers' perceptions about the risks of hazards in the workplace, the worker's opinion of PPE regulations.

**Table 1.** Frequency Distribution of Activator Factors in PT ARPS 2018

Variable	Category	Amount	Percentage (%)
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Knowledge	Good	38	97.4
	Enough	1	2.6
Perception	Good	25	64.1
	Enough	14	35.9
PPE regulations	Good	24	61.5
	Enough	15	38.5

Based on the activator factor distribution data on 39 respondents of the Blow Molding, Maintenance and Injection Molding unit at PT ARPS obtained 97.4% of respondents have good knowledge about PPE and knowledge of OHS, 64.1% of respondents have a good perception of the risk of accidents and hazards not using PPE, and 61.5% of respondents had a good opinion of company regulations in support of PPE usage behavior.

From this table it can be seen that the level of labor knowledge of PPE is good, for perception and regulation factors are good, but there are still many workers who have a low level of perception and understanding of regulations.

**Table 2.** Frequency Distribution of Safety Behavior Factors Related to Compliance with PPE Use in Technician Work of the Blow Molding, Maintenance and Injection Molding Section at PT ARPS 2018

Category	Total	Percentage (%)
Good	4	10.2
Enough	18	46.2
Less	17	43.6

Based on data on the frequency distribution of PPE usage on 39 respondents which is the average of observations at the 1st and 2nd hours of the Blow Molding, Maintenance and Injection Molding unit at PT ARPS obtained 10.2% of respondents have good behavior related to compliance usage PPE, 46.2% of respondents have good behavior related to compliance with PPE use, and 43.6% of respondents have a behavior that is less related to compliance with PPE use when working. From this table, it can be seen that the majority of workers have good behavior related to compliance in using PPE when working.

**Table 3.** Cross Tabulation of Occupational Health and Safety Knowledge with Safety Behavior Related to Compliance with the Use of PPE PT ARPS in 2018

Knowledge	Safety Behaviour						Total		Coefficient Correlation
	Good		Enough		Less		N	%	
	n	%	N	%	n	%			
Good	0	0	1	100	0	0	1	100	-0.104
Enough	4	10.5	17	44.7	17	44.7	38	100	

### Knowledge

Based on the data distribution 2018 between OHS knowledge and safety behavior regarded compliance with PPE shows that almost all workers who number 38 workers have quite good knowledge of OHS, of these numbers the level of safety behavior towards compliance with the used of PPE workers is quite good and not good respectively - 17 people. Based on data, only 1 person has good knowledge of OHS with good safety behavior.

The analysis of the study showed the correlation coefficient between the OHS knowledge variable and the Safety Behavior variable regarding compliance with PPE use of -0.104. Based on the value of the correlation coefficient, it can show the relationship between the OHS knowledge variable and the Safety Behavior variable, which has a very weak relationship with a negative relationship. Workers with better levels of OHS knowledge will have a tendency for the level of Safety Behavior to decrease.

The results of the study illustrate that almost all respondents in the study had a fairly good level of knowledge but were not matched by safety behavior towards compliance behaviors of using PPE in accordance with SOP, in other words the level of labor knowledge did not affect the workforce to take action in accordance with SOP.

**Table 4.** Cross Tabulation Between Perception and Safety Behavior Safety Behavior Related to Compliance with the Use of PPE PT ARPS in 2018

Perception	Safety Behaviour						Total		Coefficient Correlation
	Good		Enough		Less		N	%	
	n	%	N	%	n	%			
Good	3	12.0	12	48.0	10	40.0	25	64.1	0.108
Enough	1	7.1	6	42.9	7	50.0	14	35.9	

### Perceptions

Based on the distribution of data between perceptions and safety behaviors related to compliance with PPE shows that the most of the workers with 25 workers have perceptions about the risk of accidents and the danger of not using a good PPE, of these 12 workers have a Safety Behavior regarding PPE use compliance enough good, 10 workers are not good and the rest have a good level of Safety Behavior. While 14 workers have perceptions about the risk of accidents and the dangers of not using PPE that are good enough, of these 7 workers have a Safety Behavior level regarding obey with the use of personal protective equipment that is lacking, 6 good enough and 1 person with good condition.

The results of the research analysis showed the correlation coefficient between the variable perception of the risk of accidents and the danger of not using PPE on workers with the Safety Behavior variable regarding compliance with PPE use of 0.108. Based on the value of the correlation coefficient can be seen that there is a very weak correlation with the direction of a positive correlation.

The results of the study illustrate that workers with higher levels of perception about the risk of accidents and the danger of not using PPE, will have a tendency to have a fairly good level of Safety Behavior, in other words the high level of workers' perception of PPE as well as the risk of hazards in the workplace can influence to take action accordingly with SOP.

**Table 5.** Cross Tabulation Between PPE Regulations and Safety Behavior Related to Compliance with PPE Use PT ARPS in 2018

PPE Regulations	Safety Behaviour						Total		Coefficient Correlation
	Good		Enough		Less		N	%	
	n	%	n	%	n	%			
Good	2	8.3	10	41.7	12	50	24	61.5	-0.166
Enough	2	13.3	8	53.3	5	33.3	15	38.5	

### PPE Regulation

Based on table 4 the distribution data between PPE regulations and safety behavior related to compliance with PPE shows that most

of the workforce totaling 24 workers have an opinion about company regulations in supporting Safety Behavior compliance with PPE use is classified as good, of these 12 workers have Safety Behavior classified as not good, 10 workers are good enough and 2 workers with good Safety Behavior conditions. From these data 15 workers have an opinion on company regulations in support of Safety Behavior in compliance with the use of PPE which is quite good and of these there are 8 workers who have sufficient safety behavior, 5 lacking and 2 with good safety behavior. Analysis of the study showed the correlation coefficient between PPE regulatory variables with Safety Behavior variables regarding compliance with PPE use of -0.166. Based on the value of the correlation coefficient, it can be said that there is a very weak relationship between the PPE regulation variable and the Safety Behavior variable regarding compliance with the use of PPE with a negative relationship direction. Workers with an increasingly good level of opinion regarding the rules of the use of PPE in the company will have a tendency for the level of Safety Behavior that is not good. So it can be illustrated that some workers already have a good level of opinion about PPE regulations with no offset behavior of compliance with the use of PPE in accordance with SOP.

## DISCUSSION

### Activator Factor Component

*Application of BBS* in a enterprise is certainly based on a cause, as happened at PT. ARPS, based on the results of direct observations of workers, are still found workers who do unsafe actions due to lack of knowledge of workers about safety that can cause accidents. The unsafe behavior that is mostly done by workers when doing their work is not compliant in the use of Personal Protective Equipment (PPE) and neglects the importance of using PPE that has been recommended by the company. (Skowron-grabowska and Sobociński, 2018) Behavior-Based Safety (BBS) is a general approach to safety management, which sees the main cause of an accident as unsafe behavior carried out by someone. Integrating behavior based safety programs can be the key to success in achieving program goals. Like research (Ningsih and W, 2013) which states that the lack of management roles is due to the lack of integration of behavior based safety (BBS)

programs implemented in occupational safety and health management, al. This will have an impact that can be felt by workers, in accordance with the results of observations that indicate labor safe behavior work is still in sufficient and lacking level.

Many approaches can be taken to implement a behavior based safety program, one of them by using the ABC model. ABC Theory defines that human behavior is influenced by 3 factors namely Activator, Behavior, Consequence (ABC). This research will discuss several factors that influence the Activator of the behavior of PPE use, namely knowledge, perceptions and regulations regarding PPE in PT. APRS.

Behavior is something that someone does that can be observed, measured, and can be done repeatedly. Behavior can also be interpreted as an action (Bicard, 2012).

PPE are tools designed to protect employees from serious injury or illness in the workplace caused by contact with chemicals, radiology, physical, electrical, mechanical hazards, or other workplaces (Aguwa, Arinze-Onyia and Ndu, 2016). The components of PPE are very diverse, some studies specify one PPE element (example: respirators, gloves, masks) but other components are not explained in detail (example: barrier techniques, protective clothing) (Hersi *et al.*, 2015). From the results of direct observation of workers who use PPE on blow molding, maintenance and injection molding technicians at PT ARPS stated that 46.2% of workers have good behavior related to compliance with the use of PPE when working, but found 43.6% of workers who have bad behavior related to compliance with PPE when working. The above research results are not in line with research (Sari, 2014) in Production Unit III PT. Petrokimia Gresik shows that the majority of workers are compliant in using personal protective equipment when working (79.3%), while only a small portion of the workforce behaves not using PPE when working (20.7%). This can happen if the company is not serious in committing to the policy regarding compliance with the use of PPE, the company must also provide support to the workforce by providing training in order to establish a good attitude about compliance with the use of PPE. According to (Bisen & Priya, 2010) two important elements for creating cultural change in an organization are work training and support. Therefore, to form a culture of compliance using

PPE, companies need to involve workforce support and carry out training according to needs. Workforce support for PPE policy is very important because labor is the main actor in compliance behavior using PPE.

### **Knowledge**

The first activator factor component is the level of knowledge. Knowledge is the dominant factor in influencing someone before acting. Behavior will last longer, if it is based on knowledge, whereas behavior which is not based on knowledge will not last long (Notoadmodjo, 2007). Knowledge is the result of events that have been felt by someone, so they knowing. Sensing can be done using the human senses such as vision, smell, taste, hearing (Hendrawan, 2019).

In this study, the intended knowledge is about everything that is known by workers about OHS in general, the definition of PPE, the benefits of using PPE, time to use PPE and the terms of use of PPE. The results showed that the relationship of knowledge variables with Safety Behavior has a very weak relationship with the direction of a negative relationship. Workers with better levels of OHS knowledge will have a tendency for the level of Safety Behavior to decrease. The results of the study illustrate that all research respondents have a fairly good level of knowledge but are not matched by the compliance behavior of the use of PPE that is in accordance with SOP, in other words the high level of knowledge of workers does not make workers to take action in accordance with SOP, it is not appropriate because knowledge should be able to be the underlying information for behavior to occur. It is also not related with the research by (Nasrullah and Suwandi, 2014) 76.0% of respondents who have good safe behavior knowledge also have good safe behavior attitudes.

The research conducted by (Gultom and Widajati, 2016) states that there is a strong relationship between knowledge and poor safety. Because knowledge is one's response to the stimulus in the form of covert or closed and cannot be clearly observed so that it cannot judge actions and behaviors that can be observed directly by observers, and also supported by results research (Andriyanto, 2017) Workers who illustrate that knowledge of OHS has a strong relationship that is relatively weak with compliance behavior of the use of personal protective equipment.

This is indeed natural to occur as expressed by (Anam, 2015), that an increase in science does not always cause changes in behavior, but a positive relationship between two variables. A mistake or violation can occur because someone knows what to do but decides not to do as he knows it (Prabasworo, 2016). Violations which in this case are related to *Safety Behavior* regarding compliance with the use of PPE it happens actually because someone already knows what to do but decides not to do it. This is because someone considers violations to be legal or natural, and is easier to do without any severe consequences.

### **Perception**

Perception is the earliest stage of a series of processes for processing information. Perception is a process of using knowledge that has been stored in a person's memory and then used to detect or obtain and interpret stimuli (stimuli) received by sensory organs such as eyes, ears, and nose (Rehalat, 2014). It can be concluded that perception is the process of understanding information through human sensory systems. Perception is very dependent on one's point of view of an object. The appearance of a perception depends on an individual's ability to respond to a stimulus. These abilities that cause perceptions between one individual with another individual are different, how to interpret something that is seen is not necessarily the same between individuals. Perception is very influential on changes in behavior in a person. Perception as an individual process in organizing and interpreting their sense impressions in interpreting their environment (Sialagan, 2008). The perception intended in this study is about the opinion of workers on the risk of accidents and the risk of harm not using PPE in the workplace. This perception provides a basis for someone to behave according to what they perceive.

The results showed that the relationship between perception variables with Safety Behavior has a weak relationship with a positive relationship direction. Workers with a higher level of perception about the risk of accidents and the danger of not using PPE, will have a tendency for an increased level of Safety Behavior, about 12% have a good category, enough 48%, and 40% have less perception. The results of the study illustrate that the most of the workers have a fairly good level of perception and are in line with the level of compliance

behavior of PPE usage that is in line with SOP for workers, in other words the high level of worker perception about PPE and the risk of hazards at work can encourage workers to take action in accordance with SOUP. This is supported by an explanation (Nurlaela, 2014) states that a person's behavior is determined and influenced by several factors, one of which is subjective perception and is influenced by selective attention, characteristics of stimuli, individual values and needs, and experience. Positive employee perceptions and a proper understanding of occupational safety and health are critical determinants of the progress of the implementation of occupational safety and health programs.

Results of research conducted (Sari, 2014) also illustrates that there is a strong relationship between the level of employee perception with Safety Behavior, with the direction of a positive relationship.. As many as 91.3% of respondents who have a positive perception of the risk of accidents and hazards tend to have good safety behavior when working. This can occur because when workers have the right perception of the hazards and risks of accidents in the workplace, it will increase workers' Safety Behavior to avoid the hazards and risks of work accidents as they perceive. So it can be concluded that perception is very important because perception is a person's initial stage in concluding information. Mistakes in interpreting the perception will lead to a dangerous state and dangerous behavior.

### **PPE Regulations**

Regulation is a procedure carried out by a particular party to bring order and harmony with the needs of a particular party. Rules are also useful for mental and psychological development for those who obey them, foster respect and good personal formation (Rahman, 2016). Policy is a factor that reinforces the occurrence of a behavior, it is in accordance with the opinions that put the policy as part of the environment in the safety triad so that this opinion implies that the policy is a component of the environment that can affect behavior (Julaikah, 2019). Understanding regulations in the workplace ie regulations are laws approved by the government, these laws can be made under the OHS follow by adjusting proposals or regulations made by the company (Health and Safety Executive, 1999). The regulations referred to in this study are related to the opinions of workers regarding company policies

in supporting workforce safe behavior (use of PPE). Based on the results of interviews with Safety Managers and observations, PT ARPS already has policies and regulations related to OHS in the workplace in general, regulations regarding the use of PPE in the work area and supported by overall work procedures. The regulation was made in written form and there were some posted in the work area, this is as disclosed Roughton and Mercurio (2002) that safety regulations will be more effective if they are made in written form.

Based on the results of the study, around 65.5% of workers stated that regulations of OHS, especially regarding PPE in the company were classified as good. This means that most workers have known and understood safety regulations made by management. The research results are also aimed that the relationship of PPE regulatory variables with Safety Behavior has a very weak relationship with a negative relationship direction. Workers with a good level of opinion regarding the rules of the use of PPE in the company have a tendency of decreasing safety behavior levels. So it can be illustrated that some workers already have a good level of opinion about PPE regulations with no offset behavior in compliance with the use of personal protective equipment that is in accordance with SOP, in other words the high level of employee opinion regarding PPE regulations in companies does not support workers in taking action in accordance with SOP.

This research is in line with what was done Suyono and Nawawinetu (2010) which shows that from the results of the Continuity Correction statistical test between the regulatory variables and OHS procedures with the behavior of OHS there is no relationship between the two variables, similar results were also stated by (Nurdiani and Krianto, 2019). In the regulatory variable obtained by 68.0% of respondents with the regulation to make compliance with the use of PPE, while in the respondent there is no regulation obtained by 89.5% obey the use of PPE, the results show that workers with regulations have a smaller value than workers which has no rules. This can happen according to the statement (Notoatmodjo, 2003). Penacting a strategy to improve Safety Behavior using regulations does produce rapid behavioral changes, but these changes will not necessarily last long because behavioral changes that occur are not or have not been based on self-awareness.



## CONCLUSION

From the description of the study, it can be taken conclusion that around 43.6% of the workforce behaves poorly in using PPE in the workplace. Approximately 44.7% of workers in the Blow Molding, Maintenance and Injection Molding unit have a enough knowledge, 48% of workers have a enough perception regarding compliance with the use of PPE. Then about 50% of workers have a enough ability to company regulations in supporting Safety Behavior related to compliance with the use of PPE at PT APRS.

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