


## The relationship between unsafe acts and the incidence of work accidents in welder workers at PT Lintech Seaside Facility

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Article Info	ABSTRACT
<b>Keywords:</b> Unsafe Action, Welder, Work Accident	Unsafe action is a behavior or action taken by workers in carrying out their work so that these actions can increase the possibility of work accidents if not changed. Unsafe behavior (unsafe action) that still occurs a lot such as not using personal protective equipment (PPE), improper use of personal protective equipment (PPE), less careful or careless, lack of experience and knowledge. This study aims to analyze the relationship of unsafe actions to the incidence of work accidents in welder workers at PT Lintech Seaside Facility. This type of research is quantitative research with a cross sectional approach. This research was conducted by distributing questionnaires. The sample in the study were 38 welder workers at PT Lintech Seaside Facility. The sampling technique is probability sampling with simple random sampling method. The results of research on welder workers at PT Lintech Seaside Facility who have experienced work accidents and have a high level of unsafe action are 92.3%, while those who have never experienced work accidents and have a high level of unsafe action are 7.7%. The results of the Coefficient Cotigency correlation test show that the p-value = 0.001. The results concluded that there is a significant relationship between unsafe actions and the incidence of work accidents.
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### INTRODUCTION

Occupational safety and health for a welding worker (Welder) is needed so that occupational health safety can be realized in the work environment. The characteristics of the common causes of accidents, among others, are due to the behavioral factors of the workers themselves, namely the lack of knowledge of workers about the importance of Personal Protective Equipment (PPE), the attitude of workers already feeling professional so that the use of Personal Protective Equipment (PPE) is no longer needed when working [1].

According to previous research by [2] that accidents often occur because a lot of hot work such as the welder process (welding) and cutting (cutting) on the other hand is also carried out at a height, such as when the ship block is still hanging on the crane or on the deck of the ship, then the work is done in a short time. This causes workers to rush, forget about applicable work standards such as forgetting to wear complete PPE (personal

protective equipment), and not paying attention to the surrounding environment.

The Ministry of Industry revealed "there are around 200 shipping industry companies or shipyards in Indonesia today that are capable of producing new ships or repairing ships, the shipping industry is included in the category of strategic industries and has bright prospects for the future." Human resources are the holder of one of the important roles in the smooth running of a sea transportation company and ships are sea transportation which plays an important role in all kinds of distribution processes throughout the world, as a maritime country Indonesia, part of which is water [3].

A work accident is an event or occurrence that is undesirable and can cause harm to humans, property or loss to a process. Work accidents can also be defined as an event that we do not want and never expected the beginning of which can cause human and or property casualties [4]. An indicator of work safety in a company or industry is the number of accidents. No work accidents in an industry or company can be said to have zero accidents. Indonesia is one of the countries that has not yet reached the zero accident target to reduce the prevalence of work accidents [5].

According to the International Labor Organization (ILO) in 2018, more than 1.8 million cases of occupational fatalities occur annually in the Asia and Pacific region. Two-thirds of the world's occupational deaths occur in Asia. A total of 2.78 million workers die each year due to occupational accidents and occupational diseases. A ratio of 2.4 million (86.3%) of these deaths are due to occupational diseases, while more than 380,000 (13.7%) are due to occupational accidents [6].

Based on accident data analyzed by the International Maritime Organization (IMO), it is known that ship accidents caused by human error are  $\pm 80\%$  and of all human error it is also known that around 80% of them are caused by poor management of shipping companies [7].

Based on data from the Employment Social Security Organizing Agency (BPJS), the number of work accidents in Indonesia was 234,270 cases in 2021. This number increased by 5.65% from the previous year which amounted to 221,740 cases. The trend figure can be seen from the number of work accident cases in Indonesia which has continued to grow in the last five years. Since 2017, the number of work accidents was recorded at 123,040 cases, the number increased by 40.94% to 173,415 cases in 2018. A year later, work accidents again increased by 5.43% to 182,835 cases. Work accidents in the country increased by 21.28% to 221,740 cases in 2020. The figure also increased again last year [8].

Work accident cases in the East Java region in 2019 reached 21,506 cases. In 2020 there were 23,000 cases of work accidents with 1 percent of deaths. The number of work accidents that occurred in East Java in 2020 is quite high, and has resulted in 259 deaths, 200 people with functional disabilities, and 413 people with partial disabilities [9]. According to research [10] states that the highest percentage of work accidents is caused by unsafe actions or actions of humans (unsafe action) with a percentage of 88%, while the remaining 10% by things that are not related to human error, namely unsafe conditions, and 2% of God's provisions.

H.W Heinrich in [8] states that work accidents can occur due to unsafe actions and unsafe workplace conditions originating from humans who carry out activities in the workplace and handle tools or materials. According to Herbert William Heinrich, unsafe acts and unsafe conditions will occur if workers commit a negligence.

Data on the number of cases of work accidents at PT Lintech Seaside Facility in 2020-2021, there have been 129 cases of work accidents in the last 2 years. January to June 2020 there were 23 cases of work accidents and 2 of them were serious accidents that resulted in disability. The time period July to December 2020 saw 29 cases of work accidents. The time period January to June 2021 recorded 35 cases of work accidents. While in the period July to December 2021 there were 42 cases of work accidents and 4 of them were serious accidents, namely 2 workers suffered broken bones and 2 others were seriously injured due to traffic accidents.

Secondary data on the number of work accident cases at PT Lintech Seaside Facility in 2020-2021, the problem that I raise in this study is the incidence of work accidents experienced by welder workers. Based on data on work accident cases at PT Lintech Seaside Facility, work accidents are caused by unsafe actions taken by workers during the work process and at the production stage.

Cases of work accidents that occur during the production process in the shipyard, there are uncertainties and differences in perceptions about the background of the case. Work accidents in the production process are generally caused by negligence of workers in implementing all predetermined work procedures, on the other hand the company often ignores work safety factors for the sake of productivity [7].

PT Lintech Seaside Facility is a company engaged in services for international shipbuilding companies that provide all the needs of shipbuilding companies in addition to providing various fabrication services for energy such as oil and gas construction, industrial plants and mining companies as of Lintech's fabrication facilities aimed at serving giant frames and structures, Lintech Seaside Facility (LSF) is internationally recognized for having completed many international project deliveries in heavy steel fabrication, preassembly frames and yards.

Shipyards with a limited number of personnel and production facilities and the level of technology available are required to implement a work safety system so that work accidents can be reduced or avoided. Overcoming the problem of accidents in workers requires the role of individual workers as well as the role of government and companies. This research aims to identify and analyse the "Relationship between unsafe acts and the incidence of work accidents among welder workers at PT Lintech Seaside Facility" and there are several things that are hoped in the results of this study including: the results of this study as an additional treasure in the development of science and improve insight as well as a means of development according to the results of research obtained and associated with unsafe action and work accidents in the Shipyard Company and For workers as a reference and main guide in minimising the occurrence of work accidents so that they can increase the safety of themselves and others.

## METHOD

This type of research is quantitative research with a cross sectional approach. This type research was conducted by emphasising and prioritising the measurement or observation time of the independent and dependent variable data once at a time at PT Lintech Seaside Facility with allocation time from November-December. This research was conducted by distributing questionnaires. The sample in the study were 38 welder workers at PT Lintech Seaside Facility. The sampling technique is probability sampling with simple random sampling method. The data analysis technique uses the Coefficient Cotigency statistical test.

## RESULTS AND DISCUSSION

Based on the research conducted on the relationship between unsafe actions and the incidence of work accidents among welders at PT Lintech Seaside Facility, the authors can describe the results of the study in the following explanation. The author can describe the results of the research in the explanation below:

### Characteristics of respondents

**Table 1.** Frequency distribution of Welder Worker characteristics at PT Lintech Seaside Facility in 2022.

Age	Frequency	Percentage (%)
21-30 Year	21	55,3
31-40 Year	14	36,8
41-50 Year	3	7,9
Total	38	100
Period of employment		
< 5 Year	21	55,3
≥ 5 Year	17	36,8
Total	38	100
Latest education		
Graduated from junior high school	8	21,1
Graduated from Senior high school	18	47,4
College Graduate	12	31,6
Total	38	100

Based on Table 1. frequency distribution based on age of 38 welder workers at PT Lintech Seaside Facility, it is known that the highest percentage is at the age of 31-40 years, mostly 21 people (55.3%). The frequency distribution based on the working period of 38 welder workers at PT Lintech Seaside Facility shows that most workers have a working period of <5 years as many as 21 people (55.3%). The frequency distribution based on the last education of 38 welder workers at PT Lintech Seaside Facility shows that almost most of the workers have a high school education or equivalent as many as 18 people (47.4%).

## Unsafe Actions

**Table 2.** Frequency distribution of unsafe acts among welder workers at IPT Lintech Seaside Facility in 2022.

Unsafe Action	Frequency	Percentage (%)
High	26	68,4
Low	12	31,6
Total	38	100

Based on Table 2, the frequency distribution of unsafe actions of 38 respondents at welder workers at PT Lintech Seaside Facility shows that most workers have a high level of unsafe action as many as 26 people (68.4%). The frequency distribution of the last education of 38 welder workers shows that almost half of the workers have the last education of high school equivalent as many as 18 people (47.4%). Based on statistical calculations, the correlation coefficient value between the last education and unsafe action is 0.000, meaning that the last education and unsafe action have a strong perfect relationship. This study is in line with the theory that says that the education of a worker affects the way he thinks in dealing with his work, including behaviour or actions to prevent accidents or avoid work accidents while doing his job [11].

This research is in line with what was previously done by [8] about the Overview of Unsafe Action and Unsafe Conditions for Project Workers of the Bank Indonesia Silver Office (KPWBI) in Kendari City in 2019, the results showed that unsafe action was classified as high, namely 79.51%, the conclusion of this study is that unsafe actions that are often carried out by respondents are using personal protective equipment incorrectly as much as 97.59%.

**Table 3.** Frequency distribution of unsafe actions of welder workers causing work accidents at PT Lintech Seaside Facility.

Types of Accident Causes	Frequency	Percentage (%)
Not Wearing Personal Protective Equipment	3	7,9
Not Complying with Procedures or Regulations	5	13,2
Working carelessly (careless and reckless)	8	21,1
Working in poor physical condition (fatigue, stress, and drowsiness)	6	15,8
Work with jokes or joking around	5	13,2
Other (smoking and bringing personal problems)	2	5,3
Total	29	76,3

Based on Table 3. frequency distribution of types of work accidents that occurred in the last  $\leq 2$  years in welder workers at PT Lintech Seaside Facility, it is known that, most workers have accidents caused by working carelessly (careless and reckless) almost most (21.1%).

The results of interviews with Health Safety Environment workers at PT Lintech Seaside Facility, unsafe actions are high due to human factors (Human Error), namely unsafe behaviour at work, such as working with poor physical conditions such as drowsiness, fatigue, acting carelessly and not being careful, working with jokes and jokes, and working by not complying with procedures or regulations.

The results of the study showed that one of the unsafe actions taken by PT Lintech Seaside Facility welder workers with a high percentage was working carelessly and not carefully, mostly 8 people (21.1%), this is because PT Lintech Seaside Facility is engaged in the production of goods so that workers are required to pursue productivity so that it will be in line with the process of rash, careless work, and attitudes or behaviour by workers will affect the occurrence of an accident. Hasty workers can always cause accidents, because they tend to ignore the dangers around them and the existing regulations, if they work with caution, the potential for accidents is very small.

The second unsafe action was caused by working with poor physical conditions (fatigue, stress, and drowsiness) as many as 6 people (15.8%). Fatigue is caused because some workers cannot manage their time and work schedule to rest, there are also workers who still carry out other activities or work outside normal working hours, because at PT Lintech Seaside Facility only applies 1 work shift if a production progress target is achieved, but if not then workers are required to do overtime work, so that it can also affect daily sleep patterns. Fatigue is also caused by the workload of the company that requires workers to complete work on time. Work fatigue can slow reaction time or decrease responsiveness or sensitivity and decrease activity.

Occupational fatigue is characterised by a decrease in muscle performance, a feeling of fatigue and a decrease in the level of alertness. Long-term fatigue can be one of the factors that lead to unsafe actions, workers should pay more attention to work schedules ranging from working hours, rest periods, sleep patterns, and other activities outside of work that can increase the risk of fatigue. The goal is to minimise the occurrence of work injuries and accidents [12].

Not Complying with Procedures or Regulations as many as 5 people (13.2%), this occurs due to the lack of knowledge possessed by workers, besides that it also occurs due to a lack of awareness and quality of the workers themselves, so that it will lead to a feeling of underestimation of a procedure or regulation, then it can increase the risk of unsafe acts on workers.

Work with jokes or joking around as many as 5 people (13.2%), the demands of work with the achievement of heavy work intensity become a burden and pressure on the workers themselves, so that workers often provide entertainment to themselves and their friends, thus there will be a negligent attitude towards a potential work accident.



## Work Accident

**Table 4.** Frequency distribution of work accidents in welder workers at PT iLintech Seaside Facility in 2022.

Work Accident	Frequency	Percentage (%)
Have experienced	29	76,3
Never experienced	9	23,7
Total	38	100

Based on table 4. frequency distribution based on work accidents from 38 respondents at welder workers at PT Lintech Seaside Facility, it is known that most workers have experienced work accidents, namely most of the 29 people (76.3%). The age frequency distribution of 38 welder workers at PT Lintech Seaside Facility shows that the highest percentage is at the age of 31-40 years, mostly 21 people (55.3%). Based on statistical calculations, the correlation coefficient value between the last education and unsafe action is 0.025, meaning that the last education and unsafe action have a relationship with a weak significance value. Workers with young age tend to often make mistakes when working, lack discipline, are careless, hasty, follow their hearts, and care less. The difference between someone who is getting older, body functions will also decline after a person reaches his optimal physical condition at the age of 30 years, which will decrease by 1% every year such as hearing, vision, responsiveness in distinguishing things, making decisions, and short-term abilities [13].

This research is in line with research conducted by [14] with the title Analysis of Factors of Work Accidents in Tofu Industry Workers, the results showed that work accidents experienced by workers in the tofu industry included falling (95.5%), slipping (83.3%), scalded (28.8%), and scratched (59.1%). bivariate results show that there is no relationship between age, length of service, and length of work with work accidents in tofu industry workers. However, there is a relationship between unsafe action and the incidence of work accidents in tofu industry workers with the results (p-value 0.006).

**Table 5.** Frequency distribution of types of work accidents that occurred to welder workers at PT Lintech Seaside Facility in 2022.

Types of Accident	Frequency	Percentage (%)
Fall	2	5,3
Hit by an Object	4	10,5
Slipped	2	5,3
Slashed or Punctured	5	13,2
Exposed to Electricity	4	10,5
Contact with Hazardous Materials/Radiation/ Hot Temperature	7	18,4
Other (Exposed to Welding Sparks, Exposed to Grinding Machine)	5	13,2
Total	29	76,3

Based on Table 5. frequency distribution of types of work accidents that occurred in the last  $\leq 2$  years in welder workers at PT Lintech Seaside Facility, it is known that, most workers experienced accidents due to contact with hazardous materials, radiation, and hot temperatures mostly 7 people (18.4%), cut or punctured as many as 5 people (13.2%).

Based on the results of interviews with workers in the Health Safety Environment section at PT Lintech Seaside Facility, work accidents that occur in welder workers are said to be quite high, because welder work is classified as having a lot of risk factors, besides that welder work also has impacts and side effects on health with a long period of time, such as visual impairment caused by welding beams with a long work time ratio intensity, respiratory problems due to welding fumes which are very dangerous when inhaled by humans.

Work accidents experienced by welder workers at PT Lintech Seaside Facility in the last  $\leq 2$  years with the highest percentage being accidents due to contact with hazardous materials, radiation, and heat as many as 7 people (18.4%), this is due to the ratio of time intensity that has targets and loads based on work demands in the form of productivity of an item so that workers are classified as having a tendency to work carelessly and not carefully so that it will cause fatigue in the worker's body itself. 5 workers (13.2%) were cut or punctured because they were hit by a plate during the process of forming and connecting sheet metal (plates). The reason was that workers were not careful and did not use personal protective equipment such as gloves.

#### The Relationship Of Unsafe Acts To The Incidence Of Work Accidents In Welder Workers

**Table 6.** Cross tabulation of unsafe acts with the incidence of work accidents in welder workers at PT Lintech Seaside Facility in 2022.

Unsafe Action	Work Accident				Total		<i>P-Value</i>
	Have Experienced		Never Experienced		n	%	
	n	%	n	%			
High	24	92,3	2	7,7	26	100	0,001
Low	5	41,6	7	58,4	12	100	
Total	29	76,3	9	23,7	38	100	

Based on Table 6. it can be seen that of the 38 welder workers at PT Lintech Seaside Facility who have experienced work accidents and have a high level of unsafe action, most of them are 24 (92.3%) people, while there are workers who have experienced work accidents and have a low level of unsafe action as many as 5 (41.6%) people, then for those who have never experienced work accidents and have a high level of unsafe action as many as 2 (7.7%) people, while those who have never experienced work accidents and have a low level of unsafe action are 7 (58.4%) people.

Based on the results of statistical tests using the Coefficient Contingency test, the  $p$  value = 0.001 ( $<0.05$ ) is obtained, so  $H_0$  is rejected and  $H_a$  is accepted, so there is a relationship between unsafe actions and the incidence of work accidents in welder workers at PT Lintech Seaside Facility.



According to research conducted by [15] on whether Unsafe Action and Unsafe Condition affect fishermen's work accidents, the results of statistical analysis show that the unsafe action variable (p-value 0.000) significantly affects work accidents, while unsafe condition (p-value 1.000) has no effect on work accidents. The results of the study showed that slipping or falling is the most common form of work accident experienced by fishermen, followed by being bitten by marine animals or hit by thorns, tripping over machinery, and getting tangled in ropes.

This research is also in accordance with what was done previously by [16] on the analysis of unsafe actions and work accidents in the train production section at PT Industri Kereta Api (INKA) Madiun City, that there are still many unsafe behaviours that occur such as not using PPE, improper use of PPE, less careful or careless, lack of experience and knowledge. Work accidents that often occur in the train production section at PT Industri Kereta Api (INKA) Madiun City can cause losses in the form of injuries, loss of working hours, and material losses.

Based on the results of interviews with Health Safety Environment workers at PT Lintech Seaside Facility, workers who have a high level of unsafe actions and have experienced work accidents are caused by human error during the production process, while workers who have experienced work accidents and have a low level of unsafe actions are due to a new working period of  $\leq 5$  years. The results of research at PT Lintech Seaside Facility, there are 5 workers with a working period of  $\leq 5$  years who have a low level of unsafe actions and have experienced work accidents.

Vigilance against occupational accidents will improve with age and length of service in the workplace. The length of service can affect performance both positively and negatively. The work period will have a positive influence on performance if the longer the personal or individual work period, the more experience workers will have in carrying out their duties. Have a negative influence if with the increasing length of service there will be bad habits in the workforce.

The results of the study in Table 6 show that there are workers who have never had a work accident and have a high level of unsafe action as many as 2 people. Awareness arises from workers after the worker gets a reprimand from the supervisor regarding deviant actions taken in the workplace. The K3 or supervisor will reprimand if they find workers who take unsafe actions and do not follow the applicable standard operating procedures.

Other results obtained from the research in table 6 also obtained workers who have never experienced work accidents and have a low level of unsafe action as many as 7 people. This is due to the high awareness of workers in safe work behaviour so that these workers always pay attention and follow the applicable standard operating procedures (SOP), both in the discipline of using personal protective equipment appropriately, and working carefully and according to instructions.

Based on the results of statistical tests using the Coefficient Contingency test, the  $p$  value = 0.001 ( $<0.05$ ) is obtained, so  $H_0$  is rejected and  $H_a$  is accepted. This means that

there is a relationship between unsafe acts and the incidence of work accidents in welder workers at PT Lintech Seaside Facility.

Unsafe action is a deviation from the rules and is harmful to oneself, others, or the equipment. Unsafe action is closely related to the occurrence of work accidents, because the actions or behaviour of workers during work can affect worker safety. When a worker does not protect themselves against hazards around the workplace, it will increase the risk of work accidents and vice versa [17].

Work accidents in welder workers at PT Lintech Seaside Facility are caused by unsafe actions. The basis of unsafe actions can be minimised and even eliminated by changing the behaviour and bad habits of workers and conducting regular socialisation and training related to K3 culture and safe work behaviour to all workers with the aim of increasing worker knowledge, competence (skills), and worker quality.

## CONCLUSION

Based on research on the relationship between unsafe actions and work accidents in welder workers at PT Lintech Seaside Facility, it can be concluded: Welder workers at PT Lintech Seaside Facility have a high level of unsafe action with a percentage of 68.4%. Most welder workers at PT Lintech Seaside Facility have experienced work accidents with a percentage of 76.3%. There is a relationship between unsafe actions and work accidents in welder workers at PT Lintech Seaside Facility with a p-value = 0.001 (0.001 < 0.05).

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