

Application Of Personal Protective Equipment During Discharging To Ensure Crew Safety On Board The Mt Nolowati Iii Ship

Sofyan ^{*1}, Dety Sutralinda², Faris Nofandi³, Samsul Huda⁴

^{*1,2,3,4} Politeknik Pelayaran Surabaya, Surabaya, East Java

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Email Correspondence:

supyanhernandes@gmail.com.

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ABSTRACT

Work safety is a form of effort that aims to create a work environment that is safety and prevents various accidents. To improve work safety efforts, namely by using the correct Personal Protective Equipment according to applicable procedures. Personal Protective Equipment is work equipment that must be used by the crew when working on the ship. This study aims to examine the importance of the use of Personal Protective Equipment by ship crews during the discharging process. And also to find out the actions and efforts of ship officers to optimise the application of the use of personal protective equipment during discharging. The author uses a qualitative method with data collection techniques through data observation, interviews and finally documentation. The author examines how the application of Personal Protective Equipment during discharging to maintain crew safety on board MT NOLOWATI III. After conducting research and analysis, it is known that the use of personal protective equipment during the discharging process on the MT NOLOWATI III ship used by the crew does not meet the applicable standards as evidenced by several work accidents. The ship's officer's actions and efforts to optimise the implementation of the use of Personal Protective Equipment during loading and discharging have been optimised, but indeed the crew's awareness of the importance of safety culture is very low. This, needs to be given more optimal actions and efforts to the crew so that they can use Personal Protective Equipment (PPE) in order to realise and improve safety for themselves, and others.

INTRODUCTION

Ships are one of the means of sea transportation that play an important role in supporting the smooth distribution of goods, especially on a large scale. In their operations, ships are required to transport cargo with high efficiency while maintaining safety and security during the shipping and loading and discharging processes. One of the critical activities that is vulnerable to the risk of accidents is the process of discharging liquid cargo from the ship's tank to the land terminal (storage tank). This process requires good coordination between the ship's crew and port operators as well as strict use of personal protective equipment (PPE) to prevent potential hazards that can endanger life.

According to the International Maritime Organization (2024b), the use of PPE is an integral part of occupational safety standards on merchant ships as regulated in SOLAS Chapter IV in 2024 and the International Code of Safe Working Practice for Merchant Seafarers Amendment edition 2 December 2017 Regulation 10. The regulation emphasizes that all crew must use the personal protective equipment provided when carrying out work, including during loading and discharging operations. This is supported by the opinion of Susanto and Wibowo (2021) who stated that PPE not only functions to protect the body from direct danger, but also aims to reduce the consequences of accidents that may occur.

Unfortunately, there are still many cases of violations or neglect of the use of PPE by ship crews. One of them is what happened at the Marine Liquid Terminal (MLT) Ennore, India, where the helmsman did not use safety equipment such as protective glasses, chemical-resistant gloves, and a chemical suit when performing a hose disconnect operation. Indifference and excessive self-confidence because they are used to it are the main factors in this neglect (Prasetyo, 2022). Incidents like this show that low awareness of the importance of work safety can lead to fatal risks.

In addition, data shows that around 75–79% of accident incidents in the maritime environment are caused by human error which stems from ignorance, negligence, and lack of commitment to safety procedures (Widodo & Putra, 2020). Management factors also play a role in this, especially in the implementation of Standard Operating Procedures (SOP) and coaching for work safety behavior. Therefore, the role of safety officers such as Chief Officers as those responsible for work safety on ships must be emphasized more so that all safety procedures are implemented consistently.

Based on this background, researchers are interested in conducting a study on "Implementation of Personal Protective Equipment (PPE) During Discharging to Maintain Crew Safety on MT Nolowati III". This study aims to evaluate the implementation of PPE during the discharging process, identify factors that influence crew compliance with its use, and provide strategic recommendations in improving work safety culture in the merchant ship environment.

RESEARCH METHOD

Research is a logical, planned, and structured scientific activity to produce and develop new knowledge through objective data collection and analysis. In the context of applied scientific work (APW), research has an important role as an effort to apply scientific theories to real situations in order to provide practical contributions to the world of work and academia.

Type of Research

This research uses a descriptive qualitative approach, aiming to describe the phenomena that occur in the field naturally based on direct observation and narratives from research subjects. According to Rusli (2021), descriptive research is a method in which researchers examine events or phenomena experienced by certain individuals or groups, then present them in the form of a chronological narrative. The main characteristic of this type of research is the use of non-numerical data such as words, pictures, and visual observations, making it very suitable for exploring aspects of behavior, perception, and social interaction in the maritime work environment.

Location and Time of Research

This research was conducted during the Sea Practice (PRALA) period on board the MT Nolowati III ship. The data collection process lasted for ± 12 months, starting from August 11, 2023 to August 15, 2024. Data collection was focused on when the ship was docked at the jetty and carrying out the process of discharging liquid cargo at the port. The selection of this location was based on the relevance of the operational conditions of the ship to the research topic, especially related to the implementation of Personal Protective Equipment (PPE) during loading and discharging activities.

Data Sources and Data Collection Techniques

1. Data Sources

The data collected in this study consist of two types: primary data and secondary data.

- Primary data were obtained directly from sources in the field, namely the crew of the MT Nolowati III ship involved in the discharging process.
- Secondary data came from written documents, reference books, work safety regulations, and standard operating procedures (SOPs) used on the ship.

2. Data Collection Techniques

- a. Observation

Observation is a data collection method carried out through systematic observation and recording of phenomena that occur in the field (Listiawan, 2016). In this study, observations were carried out directly when the ship's crew carried out discharging work, including the use of PPE according to applicable SOPs. This method helps researchers obtain objective information regarding daily work safety practices.

b. Interviews

Interviews are used as an additional method to deepen information that cannot be obtained through observation. According to Moleong (2010), interviews are verbal communication between researchers and respondents that aim to obtain detailed information. In this study, interviews were conducted with several crew members, including the Safety Officer (Chief Officer), to explore their views on the importance of using PPE and the obstacles that often arise in its implementation.

c. Documentation

The documentation method is used to complete the data from observations and interviews. According to Sugiyono (2007), a document is a record containing past information that can be in the form of text, photos, or videos. In this study, documentation includes photos during the discharging process, a list of available PPE equipment, and SOPs related to work safety on the MT Nolowati III ship.

Data Analysis Techniques

Data analysis in this study uses the Miles and Huberman interactive model, which consists of three main stages: data reduction, data presentation, and drawing conclusions (Pratiwi, 2017).

1. Data Collection

At this stage, data is collected through observation, interviews, and documentation. Any information relevant to the research topic is recorded in full for further processing.

2. Data Reduction

Data reduction is the process of simplifying, selecting, and transforming raw data into more focused and easily analyzed information. According to Agusta (2003), at this stage the researcher focuses on the most significant things related to the use of PPE, including supporting and inhibiting factors.

3. Data Presentation

After being reduced, the data is presented in narrative form, tables, or charts to facilitate interpretation. According to Sugiyono (2023), the presentation of qualitative data is most commonly done through textual descriptions that explain the relationships between the various aspects studied.

4. Drawing Conclusions

The final stage in data analysis is drawing conclusions. In this study, conclusions are formulated based on data that has been verified and combined from various sources, including observations, interviews, and documents. This conclusion will be the basis for answering the problem formulation that was proposed at the beginning of the study.

RESULTS AND DISCUSSION

Overview of Research Object

This research was conducted on the MT Nolowati III ship, which is a tanker owned by the shipping company PT Berliant Laju Tanker TBK. This ship has the following specifications:

- Overall ship length (LOA): 131.4 meters
- Gross Tonnage: 7,361 GT
- Cargo capacity: 12,002.56 Metric Tons

During the research, the ship carried out several loading and discharging activities at ports, especially in the Asia regions. Discharging activities involved the ship's crew in various tasks such as stripping lines, disconnecting hoses, monitoring cargo transfers, and cleaning tanks.

In this process, the use of Personal Protective Equipment (PPE) is very important to maintain the safety of the crew. However, the results of observations show that there are still many crews who do not fully comply with the use of PPE according to safety standards.

Research Results

1. Data Presentation

Based on data obtained through direct observation, interviews with ship crews, and documentation during the Sea Practice (PRALA) period, the following are the main findings related to the application of PPE during the discharging process:

a. Use of PPE by Ship Crews

From observations during several discharging processes, it is known that most ship crews have not used PPE completely and correctly. Some types of PPE that are often not used include:

Table 1. Some types of PPE that are often not used

Personal Protective Equipment	Number of people not using PPE	The Risks That Occur	Frequency Not Used
Safety Gloves	4	Wounds on the hands, skin irritation, or infection.	1
Safety Helmet	2	Head injuries, even fatal brain hemorrhages.	2
Safety goggles	1	Eye damage, even blindness.	3
Overall	1	Burns, skin irritation, or illness due to exposure to hazardous materials.	3



Figure 1. PPE charts that are often not used

From the presentation of the table and diagram above, it can be concluded that safety gloves and safety helmets are most often not used by the crew. Safety gloves and safety helmets are two types of PPE that are most often ignored or not used by the crew. Irregularity or negligence in the use of these two PPEs indicates a weak safety culture on board. In fact, safety gloves have a crucial function in protecting hands from various potential hazards, such as injuries from sharp objects or rough surfaces, skin irritation due to contact with chemicals, and infections that can arise from exposure to hazardous substances or other contaminants. Meanwhile, safety helmets

play an important role in protecting the head from the risk of impact, falling hard objects, or other accidents that can cause serious injuries such as concussions, skull fractures, and potentially fatal brain hemorrhages. The impact of not using this PPE not only endangers the safety of the individual crew concerned, but can also disrupt the smooth operation of the ship as a whole, increase the potential for work incidents, and have legal and administrative consequences for the shipping company due to violations of work safety standards that have been set by applicable regulations.

b. The Role of Ship Officers in Fostering the Use of PPE

The Chief Officer and Bosun have made several efforts to foster the crew, including:

- Providing direction before the start of the discharging process
- Conducting daily inspections of the completeness of PPE
- Reminding crew who are found not using PPE
- Directly reprimanding crew who violate safety rules

However, despite these efforts, the level of crew awareness is still low. This can be seen from the continued violation of the use of PPE, especially when work pressure increases or weather conditions are bad.

Data analysis

Based on the results of data processing on the Implementation of Personal Protective Equipment during discharging to maintain the safety of the crew on board, the researcher used a descriptive qualitative method.

Regulations regarding life safety are contained in the International Code of Safe Working Practice for Merchant Seafarers 2015 edition Amendment 2 December 2017 8.3 Regulation 10 that ship crews must use personal protective equipment provided when carrying out their duties. According to international regulatory standards and applicable occupational safety regulations as stipulated by the International Maritime Organization (IMO), Occupational Safety Health Administration (OSHA) and the International Labor Organization (ILO). Quality standards for personal protective equipment are very important to ensure that the protective equipment used is effective in protecting workers from harm. The use of personal protective equipment on board is to maintain crew safety, facilitate operations and ensure safe working conditions on board. If the crew does not use personal protective equipment, it can lead to serious accidents, financial losses and legal consequences that can damage the reputation and continuity of the shipping company's operations. Therefore, all crews are required to use personal protective equipment while working.

Based on the results of interviews during the Sea Practice (PRALA) on the MT. NOLOWATI III ship for approximately 12 months, it was found that the application of personal protective equipment by the crew had not been implemented optimally every time the discharging process was carried out. It was proven that one of the crew incidents when ordered to take cargo sampling at the pump steak, the crew did not use safety gloves and safety goggles. As a result, when taking the sampling, the hands were exposed to the sampling fluid. Sampling fluid is a flammable chemical liquid that is dangerous where if it comes into contact with the skin it will cause irritation, is dangerous if inhaled, and if it comes into contact with the eyes it will cause serious eye irritation and so on. After the accident, the crew immediately poured fresh water on the hands that were exposed to the liquid. and when carrying out cargo guard duty on deck, helmsman no. 3 installed a blank flange on manifold no. 9 left, but when carrying out the activity helmsman no. 3 did not use safety gloves so that the helmsman's hands were exposed to hazardous chemical cargo that came out of manifold 9 left and the helmsman's hands were burned. After the accident, the OS immediately poured fresh water on the hands that were exposed to the liquid. With this incident, it should be able to make the crew aware of how important it is to maintain and apply Personal Protective Equipment, because if not, a serious work accident will occur.

Based on the results of the study, the helmsman no. 3 did not use the safety gloves because he was not used to it, which could slow down the work. With this incident, it should be able to make the crew aware of how important it is to maintain and apply Personal Protective Equipment, because if not, a serious work accident will occur. This has actually proven that the importance of applying personal protective equipment has a great influence on crew safety. However, there is still a lot of or even no awareness of each incident.

Discussion

In accordance with what the author experienced during sailing practice on the ship, the author will discuss the application of personal protective equipment by the ship's crew because it concerns the safety of the crew on the ship. From the presentation of the data, the author found problems regarding the application of personal protective equipment on the ship as follows:

1. Application of Personal Protective Equipment (PPE) by the ship's crew when discharging on the ship

The application of personal protective equipment by the ship's crew has not been maximized in accordance with the international and national standards that have been set. There are still some crew who ignore the importance of using personal protective equipment to protect themselves from the dangers around them, so that when carrying out the discharging process, one of the ship's crew experienced an unwanted incident when the crew was ordered to take cargo sampling at the pump steak, the crew did not use safety gloves and safety goggles. As a result, when taking the sampling, the hands were exposed to the sampling fluid. Sampling fluid is a flammable chemical liquid that is dangerous where if it comes into contact with the skin it will cause irritation, dangerous if inhaled, and if it comes into contact with the eyes it will cause serious eye irritation and so on. And there are some jobs done by the ship's crew without using complete personal protective equipment such as disconnected hose work, pressure gauge replacement, mopping in cargo tanks, and chipping on deck. This shows that the work safety culture among the crew still needs to be improved for the safety of themselves, others, and the smooth running of the discharging process.

2. Actions and Efforts of Ship's Officers to optimize the implementation of the use of Personal Protective Equipment (PPE) during discharging.

The actions of ship's officers to optimize the implementation of the use of personal protective equipment for the ship's crew, the chief officer as the safety officer on board always reminds the crew who do not complete the use of PPE according to standards during the loading and discharging process. However, in reality, the crew pays less attention to safety culture. So it is still found that many crews do not use the PPE standards that have been set by applicable international and national regulations. Efforts as a safety officer will follow up on this matter firmly and provide an understanding of the risks of not using personal protective equipment. If the crew still does not follow the advice, the chief officer will be reported to the office to remove the crew who do not implement this properly, because it can harm themselves, others, or the Company.

CONCLUSION

Based on the research results obtained through testing and data analysis in the previous chapter, it can be concluded that:

1. The application of personal protective equipment by the crew on the ship during discharging is not implemented properly. Therefore, there are still accidents at work. During the researcher's sailing practice on the ship, there were several work accidents, which may still be considered minor by the ship's crew. If the application of personal protective equipment is implemented properly, it may be able to reduce the incidence of accidents at work, especially during discharging.
2. The actions and efforts of the ship's officers to optimize the application of the use of Personal Protective Equipment (PPE) during discharging have been optimized, but the crew's awareness of the

importance of safety culture is very low. Therefore, it will be more difficult to implement personal protective equipment, unless there are more stringent actions to increase the awareness of the ship's crew.

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