

Analysis of Navigation Ability During Bad Weather in Shipping on MV CH. CLARE

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Abstract—In order to reduce case of ship accidents, this study attempts to provide a general description of the roles and responsibilities of a ship's officer, whether there is bad weather or not. This study was officially conducted on MV. CH CLARE. The bulk carrier fleet of PT. KSM Indonesia includes MV. CH CLARE. The author trained at sea during the period of time since February 6th, 2022 to March 14th, 2023. The source of information for "Safer Shipping Cleaner Ocean" is interviews which were conducted between researchers and officers on board ships about their roles and responsibilities in navigation. The findings show how the commander's ignorance of their obligations compromises the safety of the crew and increases the number of unfinished labor. This study increases knowledge and readiness for prudent precautions, prevents accidents while at sea, helps ship operations in safe navigation, and increases ship officers' awareness of their responsibilities to prevent more abandoned work.

Keywords—Bad Weather; Accident; Navigation; MV CH Clare.

I. INTRODUCTION

The matter of shipping safety is one of the shared responsibilities and concerns of all parties, especially for those who are working in the shipping industry. This matter has a significant impact, especially in relation to the safety of life at sea and ship cargo, which has a direct impact on the trust that customers have in sea transportation services.

The following case is an example of a ship accident case due to bad weather. Quoted by kumparanNEWS, there were 12 Indonesian sailors that were missing in action after a typhoon off the coast of Taiwan damaged the cargo ship where they were working on. Taiwanese officials began search and rescue efforts on Monday, October 31st, 2022. According to information obtained by the search team, Typhoon Nalgau hit Taiwan at the time of the sad tragedy. According to Taiwan News, five Indonesian sailors have been found, although twelve are still missing. This regrettable episode began on Sunday, October 30th, when the Shin Shuen No.1 ship, under Panama flag, departed from the port of Kaohsiung in Taiwan. The cargo ship was hit by a storm while sailing. Engine failure was caused by the disaster. There were 17 Indonesian nationals on board, according to information obtained by Taiwanese officials after the ship sailed from Kaohsiung port, and it is believed that on Monday night, the ship sank. After the incident, no gasoline was poured into the water, according to Anadolu's investigation, local Taiwanese media reported.

Typhoon Nalgau occurred when Shin Shuen No. 1 hit the Philippines first, then headed for Taiwan. The Philippines suffered severe damage from Typhoon Shin Nalgau, also known as Paeng. This incident caused 110 people to lose their lives due to the storm. Through the background above, the author tries to formulate the problem about how procedures which must be carried out by officers when navigating in bad weather conditions.

II. LITERATURE REVIEW

A. Navigation

According to Supriyono (2000), Navigation is the process of guiding a ship's journey from one location to another safely, smoothly, and without colliding with obstacles or dangers to shipping. The Greek words Navis, meaning boat or ship, and Agake, meaning to direct, are combined to get the phrase navigation. The literal meaning is to navigate a ship while at sea. Research has been carried out to discuss how to navigate when facing bad weather, for example: COLREG Rule 19 Conduct Of Vessel In Restricted Visibility. As the most experienced sailor on the voyage, the crew will certainly know more and be more adept at seeing bad weather, especially from early September to early March when bad weather usually occurs.

Everyone on the ship has a duty and responsibility to ensure the safety of the shipment. The captain bears the primary responsibility. Naturally, additional individuals need to be taken into account for their safety, especially on ships where cadets learn to sail on passenger ships. There are internal and external elements that affect the safety of the voyage itself in terms of shipping safety. Internal elements include:

- The navigation skills of the ship's mate.
- Good navigation tools.
- Passengers' awareness of their personal safety by heeding the warnings issued.

- In addition, the ship is in a seaworthy condition. While natural factors are external factors. Natural elements have a significant impact on the navigation process while sailing, especially in bad weather. When the weather is bad, navigation is usually more active and comprehensive than in good weather. Water weather data can be obtained through the nearest coastal radio station or information from central BMKG (Meteorological, Climatological, and Geophysical Agenc. As a result, the captain can determine the general condition of the sea to be traversed. To predict and characterize any scenarios that may arise, in particular such as:

- Poor preparation for a typhoon (sudden weather)
- Incompetence of the crew during a typhoon (bad weather).
- Incidents of delayed departure as a result of making every effort to avoid bad weather.
- The substandard acceptance of the ship's mate to bad weather forecasts.

B. Factors which can cause accidents during bad weather

- Human error
Errors made by the crew can also result in ship accidents during shipping. According to (Lucky Andoyo W 2015) Human error is often stated as the main factor causing an accident.
- Bad Weather
One of the variables that contribute to ship accidents is the weather. In the shipping industry, bad weather is greatly feared because of the potential for several incidents at sea, including the sinking of ships that can result in many casualties. Weather is one of the causes of ship accidents with a percentage of 10.75%, far different from the cause of ship accidents caused by human error which has 78.45% and followed by other factors, namely 9.67% technical problems, although the difference in percentage, the weather has a very large influence on every voyage
- Technical Factors
The technical aspects of the ship are the most common cause of ship accidents among other contributing variables. Technical variables include things such as the condition of the ship and its equipment, ship maintenance and repairs, and the condition of the ship's engine that can cause ship accidents which start from within the ship. The crew and shipping companies should not underestimate the technical elements, because they can directly reduce the risk of ship accidents by carrying out repairs or maintenance.

C. Preparation Before Entering Bad Weather Areas

- Identifying The Weather
According to (Ajeng Mallira, 2023) ships that will sail are at risk of facing accidents, the causes of which are natural factors, human negligence factors, and environmental factors and equipment factors. Bad weather is a natural factor which should be prevented by conducting training that includes the

readiness of the crew and the condition of the ship in dealing with bad weather. When conditions are not typical and there are waves above four meters and winds exceeding six on Beaufort scale, it is considered bad weather.

There are 3 methods which need to be considered and they are such as:

- Facing the waves right on the bow
- Ships facing the waves and winds that cause the ship's deck to be wet
- Stopping the engine and floating must be considered.

- Optimizing Ship Maneuverability

One aspect of maritime conditions that affects ship mobility is bad weather. Here, "bad weather" refers to unfavorable sea conditions caused by wind, waves, and other factors. Thus, the ship's commander must be able to navigate the ship as safely as possible under these conditions. When traveling in bad weather, other officers must also be prepared for the assigned duties in addition to the navigation officer. Preparations must be made by the First Mate as Officer in Charge of Cargo, per H.I. Lavery BA, Master Mariner, MNI, MCIT, Shipborne Operation Second Edition. The deck seals and manholes used to close the tank space must be strong enough and tightly sealed to withstand the shaking caused by the ship and cargo due to the influence of bad weather. This is necessary to ensure that there is no movement of cargo during unexpected bad weather while sailing. Shipping conditions remain safe and the accident rate is as low as possible.

As the author found when practicing sailing on the MV, weather conditions are still difficult to predict even by using instruments such as cyclonic rain, zenithal rain, orographic rain, and monsoon rain conditions. Together, CH CLARE. The author's sailing practice in March, which continued until the monsoon winds shifted and the meeting point between the east and west monsoons was reached, was what triggered the rain. The captain constantly instructs the officers to be prepared for any weather, especially when the weather strikes unexpectedly. Unanimity in the movement of the ship can sometimes arise from unexpected bad weather conditions. So, when steering the ship, the convert sometimes needs to act differently from the current practice. The first officer stated that the following procedure should be followed such as: when it rains, the ship should slow down and perform a zigzag maneuver. When the weather is considered good and the conditions are considered safe enough, the ship's speed will be increased to adjust the time the goods arrive. The ship will still be delayed in reaching its destination if there is bad weather that lasts more than a few hours at sea. Because of placing a higher priority on the crew and the safety of the ship, this situation arises. Officer When bad weather is detected by radar, I occasionally guide the ship manually by turning the avoidance to the left or right to avoid areas that are heavily affected by the weather. It is better to avoid weather that may endanger the ship than to fight the weather because navigation aids are available to help avoid bad weather that poses a risk to the safety of the ship and sailors.

D. Procedures which must be carried out when facing bad weather

Bridge resource team management about How to Prepare for Navigation Safety, which is effectively handled by the captain and assisted by officers and crew who are constantly working to keep the ship in a well-managed state.

- Determine the features of a typhoon (a type of terrible weather) including its speed of movement, the pressure it creates, wind speed, sea conditions, currents, fog, and clouds. If the ship is still within a safe distance of 300 miles, estimate the position of the typhoon which is still moving closer to land every six hours. Take precautions against the dangers of the typhoon and schedule the ship's departure when you realize its bad condition, with a top speed of only 10 knots.
- In order for the crew to immediately secure any equipment that is ready to be moved, easily destroyed, or might endanger the ship, the captain must also immediately inform them of the weather updates received.
- The captain is also responsible for informing the bridge team about bad weather, procedures to be followed, the ship's position in bad weather, regulations governing the ship's movement during navigation, and tactics used when sailing to avoid bad weather or typhoons, the helmsman or bridge team assumes all leadership duties under the direction of the captain, while the captain provides direct supervision or remains on the bridge to support the officer on watch. planning and implementing safe positioning techniques, such as determining the ship's final destination or a safe distance from the center of the typhoon. When a storm moves, the ship will immediately depart under the direction of the bridge resource management team, allowing it to escape bad weather and typhoons in general, and maritime accidents in particular. Disadvantages: It takes a long time because it requires preparation in terms of theory and practice applied by the company. It also requires a more thorough explanation because the bridge team also includes the helmsman in addition to the ship's officers and works together to carry out the management of the bridge resource team. Finally, the second master is responsible for making a voyage plan and navigation aids before the ship departs. Although in the worst conditions when facing a crisis or accident, this is not the best action.



Figure 1. Ship Bridge of MV. CH CLARE

III. RESEARCH METHODS

This study uses qualitative research. The use of qualitative research aims to understand the phenomenon of what is experienced by research subjects, such as behavior, perception, motivation, action, and others, holistically and through verbal and written descriptions, in unique natural settings, and using various natural methods. In qualitative research, the level of specific characteristics is measured. Observers must be aware of the characteristics of the observation to find something in it. As a result, the formulation of basic assumptions marks the beginning of the qualitative method research process. After that, it is connected to the principles of reasoning related to the research. Information collected through questionnaires and interviews is revealed.

Population is the entire area consisting of an object that will be observed later and has the same characteristics, if not all, with a data source of the population studied which is represented by or included in the sample. The sample refers to the collection of information from a subset of the population that is considered to represent the full population, or a subset of the population being investigated. This study involved 23 crew members employed belong to MV ship of CH CLARE as its sample.

The author uses qualitative descriptive analysis with the fishbone technique to analyze the main problem. This method provides a detailed description of field events, including the emergence of problems, their causes, and analysis of the problem until a solution is found. The following statements are root causes of problems which are such as:

- If you are not sure how to understand weather news, what steps should you take to avoid just accepting incoming weather reports.
- Failure to prepare cargo and work crews before approaching areas of bad weather.
- Poor English skills mean that a ship will never be able to communicate with other ships to find out about local weather.

IV. RESULTS AND DISCUSSION

A. Results Of Research

• Observation Results

Entering mid-January 2023, MV. CH CLARE ship had loaded and was ready to depart and at that time was in Amamapare, Indonesia and would head to the port of Kwangyang, R.O Korea, the description of the shipping data is:

Date of Departure: 25th of January 2023,
From :Amamapare, Indonesia, To :Kwangyang, R.O Korea,
Last Port of Call: Amamapare, Indonesia, Crew on Board: 23 Persons.

The ship sailed from Amamapare, Indonesia on January 14th, 2023 in the early hours of 05:25 local time, the ship was moving at a speed of 10 Knots, heading to the Port of Kwangyang, R.O Korea. When sailing without the crew's knowledge if on January 25th, 2023 there was news of a ban on sailing due to typhoon news from the JMA (Japan Meteorological Agency) station, the officer on duty at that

time immediately reported the news to the captain.

After receiving communication from the corporation, the captain of MV. CH CLARE immediately went to the bridge to inform the entire crew that day that all ships were prohibited from operating. The captain also gave them instructions to prepare for bad weather and take shelter in Okinawa, Japan (Drifting ship). Furthermore, a crew member instructed all other crew members to secure the tie hatch and cover it with a double layer of cloth to prevent water from entering the hatch. After carrying out Shelter for 1 day in Okinawa, Japan, the typhoon point had moved away and sea conditions had improved, the Captain gave instructions to sail back to Kwangyang Port, R.O Korea. On January 27th, 2023 When the ship reached the port, the crew was ordered to open the hatch because the cargo was prepared for loading and unloading.

• Interview Reseach

Through the results of the interview with respondent I (chief officer) about observation (Rule 5). What are the observers doing when navigating in bad weather?

"When carrying out watch duty during bad weather, the crew carrying out watch duty which must be able to make careful observations, observe the characteristics of typhoons/bad weather faced, check the navtex receiver periodically and use the navigation equipment on board, the helmsman also reports the conditions of waves, wind, temperature".

Implementation of watch duty during bad weather, observers must change the course of the ship trying to avoid typhoon points as far as possible. The guard is assisted in making observations and reporting objects, lights observed, and sounds heard by cadets and helmsmen to avoid the danger of collision or the ship running aground when the apparent power conditions are limited.

From the results of the interview with respondent II (second officer) about Navigation Equipment.

What needs to be considered and used when detecting bad weather while carrying out watch duty when the ship is sailing in bad weather conditions?

"Navigation equipment that needs to be considered and used during the implementation of the watch duty such as Navtex receiver, INMARSAT C at night and fog or bad weather, and GPS navigation tools, Echo Sounder, Radar, Ais, Ecdis, and Radio used to communicate with other ships and these navigation tools play a very important role in the safety of navigation when the ship is sailing. "

Navigation equipment on board the ship needs to be considered such as Navtex Receiver, INMARSAT C, DSC, GPS, Echo Sounder, Radar, Ais, Ecdis and Radio are navigation tools that are very important to know which can be used when making observations and these tools play a very important role in the safety of navigation where navigation tools must be known how to use them.

B. Discussions

The following discussion will analyze the problems that have been described in the chronology of events above to find solutions by reviewing and comparing them with current theories and appropriate navigation techniques in bad weather. This is done after determining the cause of the problem that occurred based on the description of the available data. The following statement below is a thorough examination of the current issues:

- In the description of the incident data, it is known that the Master must be informed of any developments that endanger the ship, such as weather news indicating the formation of bad weather or the presence of a typhoon near the ship's position. This is because, usually, air pressure in tropical areas never deviates far from its average value.
- In the midst of bad weather, dangerous sea conditions, and concerns about the stability of the ship while traveling from Amamapare, Indonesia to Kwangyang, Republic of Korea, the officer on watch instructed the helmsman to check the cargo in the hold, ignoring his personal safety. In bad weather, no crew members are allowed on deck unless absolutely necessary. When bad weather strikes, all people deployed on deck must wear life jackets, have radios (transceivers), stay in touch with the platform, and, if necessary, be accompanied by backup personnel who are constantly watching them and wearing luminous clothing.
- The captain must study first about the news and carefully consider the conditions of the waters, the ship, and the time that has been set before making a decision after receiving weather reports from weatherfax and navtex as well as warnings or warnings given by the coast station or the local Marine Department in the data description.
- As the officer in charge of cargo affairs, the first officer must strengthen the security for the cargo he is carrying, install lifelines if necessary as a precaution, and tie any goods on deck when there is news of bad weather. Before bad weather occurs, it is very important to check and tighten the lashings on cargo ships in particular. If necessary, work on deck during bad weather must be carried out with the approval of the captain and the officer on duty on the bridge must be notified.
- As the officer in charge of safety equipment, Commander 3 must take precautions against bad weather before it occurs. One of the precautions is to put his equipment in the Boatswain until the bad weather passes. There is a possibility that no buoys will be injured or carried away by the waves if this step is taken. At least, this can reduce the total damage that occurs.

V. CLOSING

A. Conclusion

The author draws the following conclusions regarding the handling of bad weather on CLARE MV.CH based on the findings of the study and discussion of the discussion:

In particular, the captain includes the work of the second pilot in making a voyage plan and directing the voyage, which plays an important role in ensuring sailing safety. In addition, how to deal with bad weather while traveling and you have the duty of the watch officer to navigate the ship according to the official voyage plan of the captain, ensuring its safe operation. In addition to being asked to monitor any indicators related to the safety of the crew, ship and cargo, pay close attention to the weather.

B. Suggestion

Based on the conclusions made in the above discussion on techniques for solving problems related to navigation in bad weather, the author makes the following recommendations to improve navigation safety in bad weather:

- As the captain must hold additional meetings to discuss bad weather. In addition, it is the responsibility of the captain as a captain or pilot of two people to ensure that the supporting infrastructure for maritime navigation is always kept in a usable condition.
- Crew members are aware of each other's roles and responsibilities, as the officer in charge of the watch informs the captain when they are identified. This originates from safety meetings and is implemented as far as possible when distance seems limited. In practice, the officer in charge of the watch and the captain follow COLREG 1972 rule 5 (Look-out or observation) for navigation, followed by rule 19 (Conduct of vessels in restricted visibility) or rule 6 (Conduct of vessels in restricted visibility), if there are risks in the surrounding area that could endanger the safety of the vessel.
- Before entering, checking the navigational news via Navtex, Weatherfax, Inmarsat or VHF should be the first thing to do after determining whether or not an area is foggy and identifying potentially dangerous navigational objects in the area. This is intended to help prepare the crew for low visibility.

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