

Conference Paper

Shipping Accidents Due Caused by Natural Disasters and How to Handle Them

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Abstract

Accidents can occur to ships whether they are in transit, at anchor or are carrying out loading and unloading activities at the port or terminal - despite preventative measures (such as the Health and Safety Work Act, 1974). These measures concern both regular and emergency situations. An emergency usually occurs as the result of not adhering to established system procedures or due to natural disturbances. Planning and preparation are the main requirements for successful coping with an onboard emergency. The captain and officers should be aware of what they should do in various emergencies, for example fires in cargo tanks, engine rooms, A.B.K. rooms and people passed out in tanks, ships off dock and drifting, boats off dock, and other emergencies. Staff must be able to quickly and accurately decide what to do to deal with any kind of emergency.


Keywords: Natural Disaster; Handling; Ship Accident.

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1. Introduction

Sea transportation is one of the transportation elements in Indonesia, which from a geographical perspective, has a very big role. This is because sea transportation is a vital and strategic means of accelerating the economy, strengthening national unity and integrity, and influencing all aspects of the life of the Indonesian nation and state. The importance of sea transportation is reflected in the increasing need for sea transportation services for the mobility of people and goods from and to all corners of the country.

Apart from that, sea transportation also plays a role as a support, impetus and driving force for regional economic growth that has the potential, but has not yet developed, in an effort to increase and distribute development and its results. (Soewedo & Hananto. (2009). Lingkungan dan Keselamatan Transportasi. Jurnal Manajemen Mutu, Vol. 8, No. 2, UPN, Jakarta. Accessed on 17 October, 2020) The economic growth of a country or nation depends on the availability of transportation within the country or nation concerned. Why is that? Because transportation creates and increases accessibility (degree of accessibility) from natural resource potentials and markets. (Mandaku.

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H. (2010). "Analisis Kebutuhan Transportasi Penyeberangan Pada Lintasan Hunimua-Waipirit", Jurnal Arika Vol 4, No. 1, UNPATTI, Ambon. Accessed on 17 October, 2020)

Ships as a means of sea transportation and a place where many people yearn for their lives. Every time the safety of human souls at sea is threatened, both sailors and those who sail. From the facts and data, it is obtained that the sea accident has claimed a lot of lives and property, the accident can happen anywhere, anytime and happen to anyone. For this reason, the crew and passengers must know about ways to escape when there ship accidents (personal survival technique), fire fighting, first aid and personal safety in social responsibility (personal safety and social responsibility).

Shipping Safety and Security The definition of shipping safety and security in general can be referred to from Act No. 17 of 2008, concerning Shipping. In general, the definition is: Sailing Safety and Security is a condition where safety and security requirements are met with regard to transportation in waters, ports, and the maritime environment. (Act No. 17 of 2008 concerning Shipping) The safety level is indicated in the output parameters, while the safety assurance level is indicated in the input and process parameters. The safety output parameter by accident data statistics per the frequency of transportation activities, which can be the number of accidents, casualties, injuries, and measured financial losses. Meanwhile, the input and process parameters can be in the form of the availability of certified operators, the availability of feasible and certified infrastructure with adequate capacity, the availability of operational-worthy facilities, the completeness of a good and certified operation provider organization, and the existence of an efficient regulatory organization. Input and process parameters are controllable parameters, while output parameters are uncontrollable parameters.

Transportation safety is something that absolutely must be fulfilled. This safety includes land, rail, air and sea transportation modes. Sea transportation safety has several elements that must be met. Sea transportation safety, hereinafter referred to as shipping safety, must meet at least 2 proper criteria. First is seaworthy and second is worthy of the screen.

Accidents can occur to ships whether they are in transit, at anchor or are carrying out loading and unloading activities at the port/terminal even though efforts have been made to avoid them. Management must pay attention to the provisions stipulated in the Health and Safety work Act, 1974 to protect seafarers and prevent risks in carrying out an activity on board, especially concerning occupational health and safety, both in normal and emergency situations.

An emergency usually occurs as a result of not working normally in a procedural system or due to natural disturbances: (DA, Lasse. (2014). Keselamatan Pelayaran di

Lingkungan Teritorial Pelabuhan dan Pemanduan Kapal. Jakarta: Grafindo Persada. p.12)

1. Procedure: A work procedure or guideline that must be followed in carrying out an activity in order to get good results. Emergency: A condition other than normal which has a tendency or potential to endanger the safety of humans, property and the environment.

2. Emergency procedures:

Procedures/work guidelines in dealing with an emergency, with a view to preventing or reducing further or greater losses. (M. Riyadi. Persiapan Menghadapi Tsunami http://www.etipsbali.wordpress.com/persiapan_menghadapi_tsunami. Accessed on 17 October, 2020)

Weather factors greatly affect ship travel. From the NTSC report, it was stated that a number of events the ship sank due to bad weather. The crashing waves and high waves caused the hull to leak, which was fatal. The Wahai Star Motor Ship (KM) sank on July 10 2007 due to weather factors so that it had a leak in the engine room. That was the return of KM Samudra Makmur, which sank on May 17, 2008. Terrain/Trajectory Apart from weather, ocean terrain also affects the safety of ship travel. Meanwhile, conditions in the oceans such as the presence of corals, rocks and icebergs also risk disrupting ship trips.

Therefore, it is important to determine the position of the safe route that can be crossed by the captain, the person who steers the ship, has an important role. The master's experience and dexterity determine the safety of the ship's journey. The captain must know the maximum capacity of the ship before sailing. In addition, the speed of the captain in making decisions also affects the ship he is driving. (<https://nasional.kompas.com/read/2018/06/23/21370511/ini-faktor-faktor-yang-sering-jadi-penyebab-kapal-tenggelam?page=all>. Accessed on October 17, 2020)

Shipping Company Management System Duties and responsibilities of shipping companies regulated in ISM code have a wide scope, including:

1. Safety and Environmental Protection policy,
2. Authorities and Responsibilities of the Company,
3. The powers and responsibilities of the skipper,
4. Resources and personal,

5. Readiness to face emergencies,
6. Maintenance of the ship and its equipment,
7. Documentation, certification, verification and supervision purpose of the ISM code (International Safety Management code) system in ship operational safety and ship accident prevention is to:
 - (a) ensuring Safety at Sea,
 - (b) prevent human accidents/loss of life/life,
 - (c) avoid environmental damage caused by accidents and pollution at sea,
 - (d) safeguarding the cargo being transported and the construction of the ship.

Tsunami (derived from Japanese: Tsu = port, Nami = wave, literally means “big waves at the harbor”) which means the movement of water bodies or ocean waves that occur due to impulsive disturbances. This impulsive disturbance occurs due to changes in the shape of the seabed caused by sudden changes in sea level vertically or in a horizontal direction. (Priharjadi. (2009). Indonesia Potensi Tsunami. Jakarta. p.22)

Changes in sea level can be caused by an earthquake that is centered under the sea, an underwater volcanic eruption, an underwater landslide, or a meteor strike at sea. Tsunami waves can travel in any direction. The energy contained in a tsunami wave is fixed with a function of its height and speed. In the deep sea, tsunami waves can travel at speeds of 500-1000 km per hour. Equal to airplane's speed. Deep-sea wave height is only about 1 meter. Thus, the wave speed is not felt by the ship in the middle of the sea. When approaching the coast the speed of the tsunami waves decreased to about 30 km per hour, but the altitude had increased to reach tens of meters. (Ibid)

The impact due to the Tsunami in the middle of the sea causes high waves so that it can disrupt the speed of sailing ships and even the ship can sink. The Impact of a Tsunami on the Coast/Harbor. With the arrival of high waves with high waves that can reach more than 10 meters due to the tsunami towards the beach, it can knock ships that are on the shore or that are docked at the port where the ship can capsize and be badly damaged.

2. Research Methods

This research uses qualitative descriptive research methods, descriptive research is the basis for all research. Descriptive can be done qualitatively so that statistical analysis can be done (Basuki, Sulisty. (2010). Metode Penelitian. Jakarta: Wedatama Widya Sastra.

p.22). Describes the object of research, systems or work steps, design and procedural steps in finding root causes and solutions in dynamic system design positioning as a heading hold controller and transfer keeping on a prototype ship using the Proportional-Integral-Derivative (PID) method.

3. Result and Discussion

Types of Emergency Procedures:

1. Internal procedures (local)

This is an implementation guide for each division/department, with the understanding that the emergency that occurs can still be handled by the relevant departments, without involving ships or local port businesses.

2. General procedure (main)

It is a company guideline as a whole and has to do with an emergency that is large enough or at least can endanger other ships or the dock/terminal.

In terms of the prevention, it requires the mobilization of a lot of manpower or involving ships/local port authorities.

Ship Accident Management In the event of a ship accident, several things must be considered:

1. Be responsive and accurate in the ship accident,
2. Do not forget to collect authentic evidence,
3. The Captain, the officer and crew of the ship at the beginning maintained the existence of the ship and did not worsen the situation.

They must also report the ship accident that occurred immediately to the owner, H & M, as well as P & I concerned, this action should not be underestimated, report it immediately. Collecting evidence the captain of a ship is obliged to make and is ready to collect According to RP. Suyono, responsive and thorough in an accident if a ship gets an accident reports if the ship is involved in an accident or accident so that the ship and its companies are in a legal status that can be easily resolved and not complicated, thanks to the Master's accurate report to all interested parties. As evidence or physical evidence, it is attached as follows;

1. Ship diary (logbook); Usually on the ship there are several diaries or log books such as engine diaries, radio diaries, deck diaries, watch diaries on the bridge, and the main thing is the ship's diary, this book has no scribbles and no missing pages, wrong writing must be initiated where the error write. If the ship has an accident, the first thing they are asked to show is the ship's diary to be studied such as the NTSC by an authorized officer, and the captain of the ship must convince and answer the truth of the actual events, and also officers and crews.
2. Cruise map (SailingChart); The master must be sure that the position of the ship on the map has not been changed and the previous position is not deleted, because many ship violations occur in narrow shipping lanes and with the intermediary of a guide The master must see that the position of the ship is through the signs and the positions are recorded on the map and the distance when passing through a sign.
3. Ship Managing Book; The master must see that all notes in the motion book are written with ink and signed by the responsible person and nothing is deleted. For ships with technology, it is enough to take a paper copy of the printer from the printer machine. This machine records every ship's movement activity recorded when the engine is forward or backward.

3.1. Preparation

Planning and preparation are the main requirements for successful implementation of an emergency on board. The captain and officers must be aware of what they have to do in various emergencies, for example fires in cargo tanks, engine rooms, crew rooms and people passing out in tanks, ships off the dock and drifting off, how ships go off-dock and so on. -other.

Must be able to quickly and accurately decide what to do to overcome all kinds of emergencies.

Data/info that must always be ready:

1. Load quantity and arrangement types.
2. Are there dangerous chemicals
3. General arrangement and information stability, as well
4. Fire fighting equipment plan.

3.2. Emergency organization An emergency organization shall be established for emergency operations

The goals and objectives of the organization for each situation are to:

1. Turns on the alarm.
2. Finds and assesses the magnitude of the event and the possible hazards.
3. Organizing manpower and equipment.

There are four planning guidelines that need to be followed:

1. Command center.

Groups that control activities under the leadership of the captain or senior officers and are equipped with internal and external communication traps.

2. Emergency awareness unit.

A group under senior officers who can assess the situation, report to the central command advising what action should be taken and where assistance is needed.

3. Support unit.

This support group under an officer must always be on hand to assist the parent group with command of the command center and provide support assistance such as equipment, supplies, medical assistance, including respiratory support devices and others.

4. Machinist group.

Groups under the Engineer or Senior Engineer support unit provide assistance on the orders of the command center. His main responsibilities are in the engine room, and can provide assistance when needed.

3.3. Preliminary action

A person who discovers an emergency must sound the alarm, report it to the duty officer who then prepares the organization, meanwhile those on site take immediate action to control the situation until it is taken over by the emergency organization. Everyone must know where the place is and what the job is, the support group must stand-by waiting for further orders.

3.4. Ship fire alarm

1. While at the terminal, this alarm must be followed by several long blasts with a time interval of not less than 10 seconds.
2. Fire fighting equipment plan.
3. This equipment plan should be fixed in an easily visible place on each deck.

3.5. Supervision and maintenance

Because fire extinguishing equipment must always be slap to be used at all times, it is necessary to check periodically and be carried out by officers who are responsible for maintenance/repair or filling of the tubes must be on time.

3.6. Practice

To maintain the skills and readiness of subordinates, regular and regular training should be held in either theory or practice. If there is an opportunity to hold joint exercises or firefighting meetings with ground personnel, there must be an exchange of information regarding the number and location of fire extinguishers in order to facilitate implementation in the event of a fire on board.

The advantages of creating an emergency response organization include:

1. Duties and responsibilities are not too heavy, because they are borne together and are different.
2. Duties and responsibilities can be written clearly so that it can reduce actions that are less disciplined.
3. There is only one leader (commando), so orders, instructions and others will be more focused, orderly and integrated, avoiding confusion.
4. Can avoid the obstacles of the formal hierarchy that always exist in companies, because officers from various fields needed have all joined in one form of organization.
5. If there is a failure due to carrying out a certain task, it can be reviewed immediately for improvement.
6. With an emergency organization, all individuals feel connected.

From the passenger side, it is also good to know what steps can be taken as self-rescue if you are on a ship that is about to sink so that the chances of survival will be greater. Here are some steps to save yourself that you can take:

1. Stay calm

2. The most important thing to save yourself from sinking a ship is to stay calm. If you are in a panic, try to take a deep breath. The panic will make you think about saving and face greater danger.

3. Find a buoy

When the ship you are traveling on sinks, try as much as possible to find the buoy. There are several types of buoys, such as lifeboats, hard buoys, and inflated rafts. Buoys will keep you in the water longer. If you can't find a float, look for objects that will make you float. You can also look for ship debris that can be used to stay afloat, such as door leaves or ship debris that is still afloat.

4. Jumping from a boat

If you have to jump from a boat, make sure you keep your shoes on. Before jumping, make sure you don't land on top of other people or objects. For the best jumping position, namely: Place one arm on your stomach, then grasp the other elbow. Use your other hand to cover your nose. Jump as far as possible. When you fall, cross your legs and try to get into the water with your feet first.

5. Stay away from the ship, if it's big.

Large ships tend to create a suck and suck effect on everything that sinks. As a result, the bigger the ship, you have to get away from the ship when it sinks. This is important because large ships can suck you up even if you are wearing a lifebuoy. To get off the boat, here are some things you can do: Use breaststroke to swim away from the boat. Kick hard with your feet. If you are not good at swimming, stay calm, walk in the water, and slowly move away from the sinking boat.

6. Avoid Hypothermia Apart from drowning, hypothermia is the biggest threat to your safety after the ship has sunk.

Exposure to cold water lowers body temperature. If the body temperature is too low, the body will eventually go numb and risk causing death. Some things you can do to prevent hypothermia: If you are on the surface of the water with a buoy and not on a raft, bring your knees to your chest. This will help maintain body heat. If you're with other people on the surface of the water or on a raft, stick together,

and hug each other. Stay dressed. Even if they are soaking wet, clothing helps maintain your body temperature.

4. Conclusion

Shipping Safety and Security The definition of shipping safety and security in general can be referred to from Act No. 17 of 2008, concerning Shipping. In general, the definition is: Shipping Safety and Security is a condition where safety and security requirements are fulfilled regarding transportation in waters, ports, and the maritime environment. Weather factors greatly affect ship travel. From the NTSC report, it was stated that a number of events the ship sank due to bad weather. The crashing waves and high waves caused the hull to leak, which was fatal. The Wahai Star Motor Ship (KM) sank on July 10 2007 due to weather factors so that it had a leak in the engine room. That was the return of KM Samudra Makmur, which sank on May 17, 2008. Terrain/Trajectory Apart from weather, ocean terrain also affects the safety of ship travel. Meanwhile, conditions in the oceans such as the presence of corals, rocks and icebergs also risk disrupting ship trips.

References

- [1] Basuki, S. (2010). *Metode Penelitian*. Jakarta: Wedatama Widya Sastra.
- [2] Lasse, D. A. (2014). *Keselamatan Pelayaran di Lingkungan Teritorial Pelabuhan dan Pemanduan Kapal*. Jakarta: Grafindo Persada.
- [3] M. Riyadi. *Persiapan Menghadapi Tsunami* http://www.etipsbali.wordpress.com/persiapan_menghadapi_tsunami. Accessed on 17 October, 2020.
- [4] *Nasional Kompas*. (2018, June). Retrieved from <https://nasional.kompas.com/read/2018/06/23/21370511/ini-faktor-faktor-yang-sering-jadi-penyebab-kapal-tenggelam?page=all>.
- [5] Mandaku, H. (2010). Analisis Kebutuhan Transportasi Penyeberangan Pada Lintasan Hunimua-Waipirit. *Jurnal Arika*, vol. 4, issue 1. pp: 135-142
- [6] Priharijadi. (2009). *Indonesia Potensi Tsunami*. Jakarta.
- [7] Soewedo & Hananto. (2009). *Lingkungan dan Keselamatan Transportasi*. Jurnal Manajemen Mutu, Vol. 8, No. 2, UPN, Jakarta. Accessed on 17 October, 2020