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Analysis of Garbage Management on board MV. HL Samcheonpo

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Abstract

The research issues raised by what methods can be used to maximize the implementation of garbage management on board, while the aim of the research is to provide suggestion to minimize this problem. The research method used is a qualitative method while using the Miles and Huberman as approaching method to process data and then the results will be presented based on the objectives to be achieved. The data analysis techniques used including collecting primary data through observation, interviews and documentation as well as secondary data from the ship's archives. The theoretical basis used including theories about the marine pollution, garbage management, international rules governing garbage management on ships, supporting tools used to maximize garbage management, and ship operational standards regarding garbage management are also analyzed to support the research results. The results of this study found that the lack of implementation of waste management procedures on board ships is caused by the crew's low awareness regarding these procedures, leading to garbage accumulation and highlighting the need for supervision and education by officers in the implementation of waste management procedures.

Keywords: Garbage Accumulation, Garbage Management, Long Sailing Time, Operasional Standards

1. Introduction

The sea is an area in which there are various kinds of natural resources that can be used in all its contents, both for transportation facilities and to support the economy of the community. As a country whose territory is dominated by waters, of course this makes almost all of Indonesia's territory consists of coastal areas.

The sea is an important aspect of human life, because the sea is the source of all supports for human life. Starting from food sources that are very abundant in the ocean, then tourism such as Bali which is one of the foreign tourist destinations in Indonesia because of the beauty of its beaches and marine ecosystems. The sea is also one of the regulators of the earth's temperature and climate because the sea can absorb heat and then spread it into the atmosphere.

The sea also has an important role as the world's water source, seawater will be processed through filtration and then desalination, desalination according to KBBI is the process of converting seawater into fresh water. The fresh water will be used by humans as a source of drinking water and irrigation in agriculture. The next benefit of the sea for human life is as a trade route. Most of the international trade routes are carried out by sea.

Major ports in the world such as Singapore, Rotterdam, and Shanghai have become centers for the distribution of goods between countries and continents, because large ships can transport goods with large capacities. Compared to air routes that require large capital and access that may be difficult for areas that are difficult to reach by air transportation modes. This is one of the reasons why sea routes are an effective and efficient choice, so that the economic turnaround can rotate well.

The sea is also one of the transportation media both local and international. According to the records of the Ministry of Transportation in 2020, there are a total of 2,439 ports in Indonesia spread throughout Indonesia. The large number of ports makes it possible to reach remote areas that cannot be reached by air. The cost is cheaper than air transportation is also one of the reasons why sea transportation modes are more in demand.

The sea is also useful as a source of livelihood for people living in coastal areas. Coastal communities depend on all aspects of the ocean to meet all needs such as foodstuffs, trade materials sourced from the sea and tourism. All of these benefits result in people having a close relationship with the sea.

Another role of the sea for life is also one of the natural defenses of the environment to protect against natural disasters. Coral reefs, mangroves are an example of natural defense that can reduce natural disasters that may occur. Coral reefs and mangroves can break up large waves coming to the coast so that the impact of damage can be mitigated. This large effect makes it possible to minimize the damage that can be caused by the disaster, both in terms of material and casualties.

The number of ships currently operating is growing along with the development that is underway to reach a wider area, here is a picture of the development of the number of marine fleets in Indonesia:

From this data, it is proven that the number of ships operating at sea can be concluded to always increase every year. The next thing to worry about is the amount of waste generated from the operation of the ship. The increasing amount of waste from ship operations increases the risk of marine pollution if not managed properly. Examples of the consequences are as follows:

From the data explaining the amount of plastic waste in Indonesia's sea as much as 398,000 tons in 2022, this number has decreased by 35.36% compared to 2018. On the other hand, plastic waste from the ocean actually increased in the same period. From 2018, plastic waste from the sea was 77,000 tons. The amount then increased by 14.77% to 88,374 tons in 2022. It can be concluded that pollution in the ocean is increasing every year in proportion to the fleet that operates increasing every year. Therefore, it takes management from the ship itself to reduce the impact

The management in question is a good garbage management plan. Waste management itself is a waste management plan on board in accordance with international rules and applicable environmental standards. Good waste management allows for waste generated from operations on board the ship to be properly treated. Crew awareness and adequate equipment on board play an important role in good waste management on board.

Waste Management itself is regulated in Government Regulation Number 21 of 2010 concerning Maritime Environmental Protection article 3 paragraph 1 which reads "Every crew member is obliged to prevent and overcome the occurrence of environmental pollution sourced from their ship", then in article 4 paragraph 1c where efforts to prevent pollution by the crew must ensure that "the availability of waste disposal management and garbage collection tanks" and article 4 paragraph 1h where the crew must ensure "the availability of regular pollution control procedures". The MARPOL International Convention 1973/1978 Annex V regulates the disposal of garbage which is a guideline for all ships in operation, underlining that every ship must have facilities to store garbage that cannot be disposed of at sea on long journeys and is obliged to collect this garbage in a safe and organized manner.

The application of the rules regarding waste management on board ships that are already in force is still not optimal. It can be seen with the incident that occurred on a ship in 2017 as follows:

Figure 1. Crew dumps garbage into the sea



Source : *detikNews.com* (2017)

The picture shows a crew member throwing their garbage into the ocean. From this incident, it can be concluded that the awareness of the crew is still low in treatment management, this can result in marine pollution that damages the marine ecosystem if it continues to occur.

Along with this case, it can be concluded that waste management either starts from the awareness of the crew themselves, or the equipment on board. In this case, the researcher experienced a problem when carrying out marine practices on ships, namely on MV ships. HL Samcheonpo.

The time it takes for the writer's ship from the place of origin to the destination takes about 40 days. Because of this very long travel time, the researcher found the problem that waste management for shipping with a long travel time requires different procedures and management.

If the ship's equipment and procedures are inadequate, as well as the crew's awareness of the procedures on board the ship related to waste management are insufficient. It is possible that this problem will result in marine pollution that can damage the life of marine ecosystems, which will then have an impact on the community's economy, especially people living in coastal areas.

In connection with this, the researcher titled this applied scientific paper with the title "Analysis of Garbage Management on Ship MV. HL Samcheonpo". The researcher took this title because of the problems that arise when carrying out practices on board, namely waste management, where this ship takes a very long time so that it requires special handling so that management on board can be carried out properly and avoid the risk of environmental pollution.

2. Research Methods

The type of research used is qualitative research, according to Moleong (2017:6) qualitative research is research that intends to understand the phenomenon of what is experienced by the research subject such as behavior, perception, motivation, action and others holistically and by way of description in the form of words and language, in a special natural context by utilizing various natural methods. The researcher here acts as the main key to the research, the sampling of data sources is carried out by means of purposive sampling and snowball sampling, the collection technique is by the tri-angulation method (combined), the data analysis is qualitative or non-numerical and the results of qualitative research emphasize more on meaning than on generalization or comparison.

3. Results and Discussions

3.1. Data Analysis

After the presentation of the data that has been presented, namely an overview of waste management and the implementation of waste processing on board ships when going through a voyage with a long travel time in MV. HL Samcheonpo, the implementation of waste processing on board the ship is quite good in accordance with existing procedures and rules. However, waste management, especially the waste collection procedure by the crew is still relatively less than optimal, resulting in several crew members throwing garbage carelessly into the sea due to the *Garbage Store* which is starting to fill up due to the lack of effective use of waste storage space by the crew.

The lack of awareness and knowledge of the crew about waste management makes the crew more indifferent to the importance of waste management on board. This lack of awareness and knowledge has an impact on the processes that occur on board, such as the collection of waste that is mixed with both organic and inorganic waste which has the potential for harmless waste to be contaminated with other hazardous waste so that it becomes more difficult to reprocess or recycle. Another impact is the lack of awareness of the crew of the point or places where waste is allowed and prohibited by the rules to be disposed of directly, which has the potential to pollute the maritime environment. This also shows the weak sense of responsibility from the crew for environmental concerns.

Supervision from ship officers who are felt to be lacking in supervising and controlling the waste management process on board the ship by the crew is also one of the causes of waste management on board to be less effective. Officers on board have the duties and responsibilities to ensure that every procedure in waste management runs in accordance with the ship's operational standards. This lack of supervision results in the crew of the working crew tending to work based on habits and casual knowledge without using good references. Lack or absence of routine inspection by ship officers on the crew related to whether waste processing has been sorted, stored in an appropriate place, or has been disposed of according to procedures results in the results of waste processing being perfunctory.

The lack of specific waste reporting procedures from the crew to the officers, especially in the *Garbage Record Book*, where it is reported only in the event of a major incident such as the spillage of ship waste into the sea so that the careless disposal of small amounts of waste such as personal waste becomes unmonitored by the ship's officer. In addition, the lack of evaluation, internal sanctions, and formal reprimands from officers to crew

members who do not carry out waste management procedures properly give the impression that waste management problems are not a serious problem so that the crew feel that their actions are not something that can be a problem.

3.2. Discussion

Description of garbage management on board the MV.HL Samcheonpo ship

From the results of the observations that have been described and the results of interviews with several MV crew members. HL samcheonpo, waste management in MV. HL Samcheonpo has been carried out in accordance with existing procedures. The waste from activities on board the ship that will be disposed of is collected first by the crew according to their respective posts. Then the waste will be sorted according to the categories regulated in the *Garbage Management Plan* on board. After the crew has sorted the existing waste, the waste will be stored in the *garbage store*. Plastic waste that is not allowed to be disposed of directly will be stored in *garbage stores* and then disposed of at the port. General waste made of paper so that it does not take up much space can be cut into small pieces before being stored in a *garbage store* or put into an *incinerator* to be burned so that it does not take up much space. For other waste, such as food waste, cans or bottles are put into the *shredder* which will then be chopped to reduce the volume of the waste. The collected food from the kitchen or dining room will be put into the *comminuter* to reduce the diameter of food waste before being thrown into the sea, except when passing through the *PSSA* area or special area, while for kitchen waste oil will be placed in a special container which will later be unloaded at the port facility.

Especially medical waste and expired drugs will also be placed specifically before being handed over to the relevant port authorities. Electronic waste such as circuits, batteries or lights on board will be stored in a separate place where it is safe from heat sources because it is flammable. After all the waste has been collected, mualim 1 will record the total volume of waste thrown into the sea intentionally and accidentally as well as all waste stored in the *garbage store* every day in the *garbage record book*. The results of the interview also found that the awareness of the crew of waste management procedures is still lacking where there are still many who dispose of waste without paying attention to the category so that there is waste contamination or mixed waste which makes it difficult for the waste recycling process when it will be handed over to the port authority.

Maximize the Implementation of SOP (*Standard Operating Procedure*) for Waste Management (*Garbage*) on the MV.HL Samcheonpo Ship When Sailing with a Long Travel Time

Implementation of Waste Management SOPs on board MV. HL Samcheonpo during the long sailing time is applied by the crew quite well, where paper or cardboard waste will be cut into small pieces to reduce the volume of waste so that it does not take up much space, then the waste will be burned into an incinerator to further reduce the volume of the waste so that more waste can be stored. Metal waste such as cans and plastic bottles will be put into the shredder to be cut into smaller pieces so that it can be stored without using storage space effectively and making it easier when unloaded to the port. In addition to the process of burning other waste such as metal waste, or other solid waste will be processed into a compactor to be compacted so as to facilitate the preparation and effectiveness of the use of space in the garbage store. Food waste from the dining room and kitchen is collected into one container which is then before being allowed to be disposed of into the sea according to the diameter of the permitted waste, the food waste will be processed into a composter.

The results of the observations that have been made show that the crew obeys waste management procedures, especially when long trips are still not optimal. The waste that is thrown away is often mixed with waste that is not of the same type, in addition to making it difficult in the waste sorting process and less effective in the use of space so that the waste becomes accumulated and unorganized. Another result is an unpleasant smell because the garbage is piled up into one and then decomposes. The role of the above officers is very important to always monitor and evaluate the performance of the crew in complying with existing waste handling procedures. The effort made by the officers on board the MV.HL Samcheonpo where to improve this, especially during long voyages, is to always provide education about waste management to the crew every month so that all crew members are more proficient in remembering and understanding the existing waste handling procedures.

Figure 2. Muallim 1 Provides Education to Ship Crew



Source : Author (2023)

In addition to providing education, officers aboard the MV. HL Samcheonpo tries another way by always ensuring that *placards* or related posters about handling are always installed in good condition and can be easily seen by the entire crew. By installing this poster, in addition to being a sign that the ship complies with the applicable procedures so that it makes it easier during inspection by the port authority, it is as a way of communicating visually to the ship crew so that the message or education conveyed or applied is easy to understand and implement.

Figure 3. Posters that are installed when passing through the special area



Source : Author (2023)

Another method applied by officers on board is to carry out sanitary inspections every week, where the captain and other officers will check the cleanliness of each room from the garbage in the ship's accommodation so that they can monitor whether the cleaning and waste handling procedures have been running properly or not.

Figure 4. Sanitary Inspection at MV.HL Samcheonpo



Source : Author (2023)

After carrying out the inspection, the shortcomings and procedural errors will be recorded by the officer, especially mualim 3 as an assistant to mualim 1 of this inspection which will then be announced on the notice board to be corrected immediately. Sanctions will be given by the captain which can be in the form of a letter of reprimand or evaluation of poor performance that will be sent to the company to the crew of the ship who does not immediately correct the mistakes that have been recorded in the inspection results. Thus, it will provide a deterrent effect and increase the sense of initiative of the ship crew towards all existing waste management procedures.

Figure 5. Captain Education to Officers



Source : Author (2023)

The captain is also inseparable from his responsibility and always provides education to all shipmates regarding existing waste management and evaluation of the ship's crew performance so as to build a work environment and crew who are more concerned about waste management on board, especially during long voyages that require special attention related to waste management.

4. Conclusion

The conclusions that can be obtained after the presentation and discussion in the previous chapter are related to how the description of waste management on the MV.HL Samcheonpo ship and how to optimize the implementation of waste management SOPs during long voyages is the implementation of existing waste management procedures has not been effectively implemented by the crew. Often the crew when disposing of garbage is still mixed which makes it difficult for the recycling process and waste management to make the work schedule even higher because they have to re-sort the garbage that has been collected before processing. The mixing of garbage and garbage accumulation that occurs, especially during long voyages, also causes problems such as the capacity of garbage stores that are no longer able to accommodate garbage because the garbage that is left unprocessed properly and unpleasant odors that can interfere with the performance of the crew and are at high risk of being reprimanded and deficient from the port authorities. The role of the captain and officer on board is very important to ensure, monitor and cultivate the awareness of the crew to always pay attention to all waste management procedures that apply on board.

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