



Analysis of Waste Handling MV. Coral Actinia

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Abstract. The purpose of this research is to examine how waste is handled on the MV Coral Actinia, with a focus on efficiency, crew satisfaction, and compliance with applicable environmental regulations and policies. Effective shipboard waste management is crucial for maintaining a clean marine environment and preventing damage to the marine ecosystem. This research used qualitative methods, including sea practice, data collection through observation, literature review, and interviews with the crew of MV Coral Actinia. The analysis revealed that the crew adheres well to the waste handling plan. However, challenges such as limited storage capacity and insufficient supporting facilities and infrastructure were identified. These factors can impact the overall effectiveness of waste management on the ship.

Keywords: Analysis, Waste Handling, MV. Coral Actinia.

1 Introduction

The increase in marine pollution caused by waste from ships has led the International Maritime Organization (IMO) to create regulations under MARPOL 73/78 Annex V, which focuses on the prevention of pollution by garbage. This regulation consists of nine rules that emphasize the obligation of ships to prevent marine pollution. Additionally, MARPOL Annex V mandates the implementation of a "garbage management plan" on board ships. The purpose of this plan is to systematize waste management practices on ships and ensure compliance with the established regulations, helping to reduce the environmental impact of ship-generated waste in the marine ecosystem.

To reduce or even avoid marine pollution caused by ships, all crew members must have adequate knowledge, skills, and responsibilities. This includes complying with regulations related to garbage disposal and using equipment and facilities on board following established procedures. By complying with these regulations, it is hoped that the marine environment can be kept clean and free from pollution. Given the importance of the problem of marine pollution in recent times, its handling must be done seriously.

Based on the author's observations during their sea practice aboard the MV *Coral Actinia* on November 18, 2022, while the ship was en route from Singapore to Botany Bay, Australia, there was a delay in the berthing process at the port. As a temporary

solution, the ship opted to drift while waiting for docking instructions. However, due to inadequate waste storage facilities on board, waste began to accumulate, and the lack of proper containment led to the waste being scattered by the wind. This situation highlights the need for better waste management and storage facilities on ships to prevent pollution and ensure compliance with environmental regulations.

The purpose of the research is to understand in depth the waste handling procedures on the MV. Coral Actinia.

Based on the background of the problems described above, the author formulates the research question as: "What are the waste handling procedures implemented on the MV Coral Actinia?" This question aims to explore how waste is managed on board the vessel, the effectiveness of the procedures in place, and whether they comply with environmental regulations to prevent pollution.

2 Overview

2.1 Marine Pollution

Marine pollution can be explained as a negative change in the condition of the marine environment caused by the presence of foreign objects derived from human activities. These foreign objects can be in the form of industrial waste, urban waste, petroleum, biochemical waste, hot water used in the cooling process, and so on (Danusaputro Munadjad 1980: 29).

2.2 Components of Seawater Pollution from Ship

According to the book "Prevention of Marine Pollution" published by the Merchant Marine Studies Polytechnic of Makassar on page 25, the components of marine water pollution from ships can be grouped as follows:

1. Oily liquid discharge materials.
2. Food waste materials.
3. Solid waste materials.
4. Organic waste materials.
5. Inorganic waste materials.

2.3 Types of Waste

In the context of waste from ships, various types of waste can be identified as follows:

1. Maintenance waste: This includes materials collected by the deck and machinery departments during the maintenance process or ship operations, such as soot, engine dirt, paint chips, deck sweepings, paint residue, or other residues.
2. Food waste: This consists of foodstuffs that may or may not decompose, including fruits, vegetables, dairy products, poultry, meat products, food waste, food particles,

and other materials contaminated by such waste. This food waste is usually generated in the galleys and dining rooms of ships..

3. Plastic waste refers to solid materials made primarily from polymers and synthetic organics. These materials come in various forms and types, ranging from hard and brittle plastics to soft and flexible ones. Plastics are widely used due to their durability, versatility, and cost-effectiveness. However, improper disposal and accumulation of plastic waste, especially in marine environments, pose significant threats to ecosystems and marine life. On ships, plastic waste is often categorized and separated for proper disposal or recycling following regulations like MARPOL Annex V to prevent pollution of the seas.
4. Load waste: This refers to any material that has become waste after being used on a container for compaction and load handling.
5. Operational waste: This includes all types of cargo waste, maintenance waste, and cargo residues that are considered waste in ship operations.

2.4 Shelter Facilities

In the provisions of Annex V Regulation 7, some of the things that are regulated are as follows:

1. Each country that is part of the convention must ensure that ports and terminals have proper waste storage facilities. These facilities should be easy to use for ships without causing delays and must meet the ships' needs, helping to manage waste properly and protect the environment.
2. The governments of participating countries are also required to notify the relevant international organizations, which will then inform other participating countries if the containment facilities provided under these regulations are deemed inadequate or inappropriate.

In the 1973 International Convention on Marine Pollution, resolution 21 addressed the provision of containment facilities with the following points:

1. It is emphasized that waste disposal should be prohibited unless all the requirements set out in Annexes IV and V of the convention have been met.
2. There is an understanding of the need for adequate storage facilities to meet waste requirements.
3. Emphasize that the effective implementation of Annexes IV and V of the convention is highly dependent on the availability of storage facilities worldwide.
4. Encourage the government to immediately take the necessary measures to ensure the availability of adequate containment facilities to handle waste from ships.

In the amendment of Annex V MARPOL 1978 regulation 9, several provisions must be considered, namely:

1. Recording the requirements for disposal, in accordance with rules 31 and 51 in the Annex line, which shall be recorded by the crew together with the passengers.

2. Every vessel with a gross weight of 400 tons or more, and vessels approved to carry 15 or more persons, shall have a suitable waste management plan. This plan shall include written procedures for the collection, containment, treatment, and disposal of waste, including the use of necessary equipment. The vessel should also designate a crew responsible for the implementation of the plan. The plan will be based on guidelines developed by the organization and must be available in a language understood by the crew in writing.
3. All ships with a gross weight of 400 tons or more, as well as ships certified to carry 15 or more persons on board in port or terminal voyages away from shore, shall be equipped with a Garbage Record Book. This Garbage Record Book shall be one part of the ship's documents or part of the logbook and shall be compiled following the provisions contained in Annex V.
4. Implementation of the Garbage Record Book must pay attention to several conditions, among others
 - a. Each ship must record at least one hour every five or more people on board during the voyage.
 - b. For floating platforms (drilling), if exploration and exploitation is
5. Governments under the jurisdiction of the convention have the authority to inspect the garbage record book of all vessels at ports or terminals away from the coast. The government is entitled to make copies of all records in this book, and the captain of the vessel is responsible for ensuring that the copies correspond to the contents of the Garbage Record Book.

2.5 Waste Handling

With the waste management plan in place, it is necessary to identify crew responsibilities and procedures for all aspects of waste handling and storage in the appropriate vessel operating manual. This includes the steps in handling waste on board following the Garbage Management Plan which can be divided into 4 steps:

Collection. Waste collection procedures should take into account the possibility of discharging waste overboard during transit. Bins should be grouped according to type, such as cans, bags, etc., with clear markings of color, graphics, and size. A sufficient number of these bins should be available on board. The crew and passengers should be informed about the types of waste that are allowed or not allowed to be disposed of at sea.

Processing. Depending on factors such as the type of vessel, operational area, and number of crew members, vessels must be equipped with incinerators or other equipment for waste processing. Shipboard incinerators are designed to burn waste. However, the use of incinerators within ports is usually avoided as they may cause air pollution. Permits may be required before the use of incinerators in ports.

Containment. Waste from different areas on the ship should be placed in designated containers. Depending on the length of the voyage and the facilities available at the port, waste should be returned to the port for proper processing.

Disposal. Although disposal may be following Annex IV, disposal of waste to port holding facilities should be given top priority. When disposing of waste, the following points should be considered:

1. Disposal of uncompacted debris will cause the amount of floating difference that can reach the shore even if it has been disposed of more than 25 miles from the nearest shore. Therefore, weights need to be applied to the waste to make it easier for it to sink.
2. Handling of waste that may be contaminated with materials such as oil and hazardous chemicals. All of these are regulated in the Annex or laws governing other pollution.
3. To ensure scheduled disposal of waste to port disposal facilities, the ship's agent is expected to provide information on this matter.

3 Research Methods

This research was conducted on board the MV. Coral Actinia when the author carried out sea practice for 12 months and 27 days from June 1, 2022, to June 27, 2023. This research uses a qualitative method. Data were collected using observation and document study techniques. In connection with the implementation of this case study, the author made direct observations and studied documents related to the implementation of waste handling at MV. Coral Actinia.

In this study, the data were processed and analyzed descriptively and qualitatively. In this writing, the author analyzes data based on field notes or observations and documents studies that can support the research. The author provides a description or explanation of events that occur in the field and then compares them with existing theories. Thus, a solution is provided to explain how waste is handled at MV. Coral Actinia.

4 Results and Discussion

On November 18, 2022, when the ship was sailing from Singapore to Botany Bay Port Australia, it experienced a delay in berthing at the port, so the ship decided to drift to kill time. At that time, the garbage collection facilities on the ship were still lacking, so there was a buildup of garbage on the ship, and the garbage was blown away by the wind.

Through observations and document studies that have been carried out, it can be concluded that the ship's crew already has knowledge and applies waste handling on board following the Garbage Management Plan properly. However, the obstacle that

arises is the lack of waste storage facilities, which causes the implementation of waste handling on the MV. Coral Actinia is not maximized.

4.1 Garbage Collection

On the MV. Coral Actinia, waste collection depends on whether the waste can be disposed of overboard during the voyage. Each type of waste is collected into clearly marked categories, and each type of waste generated on board has a disposal bin. This approach shows good awareness of waste management on board. By considering whether or not waste can be discharged into the sea, the vessel ensures compliance with applicable regulations and keeps the marine environment clean. Waste categorization also simplifies the process of managing and processing waste on board. However, this implementation still faces challenges related to the availability of adequate waste storage facilities. As awareness of the importance of maintaining the marine environment increases, investing in better waste-handling infrastructure will be an important step to support vessels' efforts to keep the ocean clean. Every room on board is always provided with a garbage bin according to the type of waste, such as in the galley, bridge, cargo control room, engine control room, mess room, Bosun store, forward station, workshop, and every crew cabin on board.

1. Plastic waste should be stored on board before being transported to the reception facility at the port. At a minimum, plastic waste should be reduced for incineration if not separated from other waste. Annex V as a whole does not allow the marine disposal of plastic waste because plastics take a long time to break down in the marine environment, possibly years.
2. Food waste disposal overboard may be permitted if the food waste has been processed through drying or crushing at a location away from land. Crushed food scraps must be able to pass through grates with holes no larger than 25 mm. Co-ordination between the messman or chief cook and the duty officer or chief officer is required for the disposal of food waste at sea. All seaward disposal of food waste will be recorded by the chief officer and checked by the shore inspection officer.
3. Certain types of garbage can be disposed of at sea, such as paper, glass, metal, bottles, and some wrapping materials. Floating items like linings and wrapping materials should be separated and stored onboard until they can be properly disposed of at port facilities. Bins or bags can be designated for recyclable materials, like metal, plastic, or paper. Additionally, oily or hazardous waste should be securely stored onboard until it can be offloaded at a port waste facility.

4.2 Waste Processing

To manage waste accumulation, the boat and deck crew separate burnable waste, like paper or cardboard, for incineration. They cut it to medium sizes and confirm with the chief engineer and chief officer before using the incinerator. After burning, the chief engineer and chief officer record details in the garbage logbook, including the waste type, amount, date, time, and the ship's position.

4.3 Garbage Collection

To manage excessive garbage accumulation, the chief officer instructed the boat and deck crew to create temporary containers from used drums and consolidate the waste in a single location to prevent it from scattering. This main collection area on the ship is called the garbage station.

4.4 Garbage Disposal

Ports typically provide garbage disposal services for docked ships, but ships must notify the port in advance if they plan to dispose of waste. The ship needs to provide details such as the expected docking date and time, as well as the type and volume (m³) of waste to be disposed of.

MV. Coral Actinia has adopted an important practice in handling waste on board. The presence of a garbage logbook is an important instrument in recording all actions related to waste management, starting from collection to disposal. The importance of complying with the procedures set out in the Garbage Management Plan is the cornerstone of this operation. Non-compliance with good procedures could potentially lead to uncontrolled waste disposal, which in turn could pollute the sea.

Although some types of garbage can legally be discharged into the sea (excluding plastics), it is recommended that ships prioritize collecting and disposing of waste at port facilities. Reducing waste production is also key, by adjusting the ship's supplies and equipment to minimize single-use items and emphasize recyclable or reusable materials. Responsible waste handling requires full crew cooperation and a clear understanding of the procedures.

The appointment of a senior officer to lead the implementation of the waste management plan is important, with the Chief Officer as the responsible figure. This ensures close supervision and effective coordination in carrying out the waste management process following the prescribed plan. As such, the implementation of these practices at MV. Coral Actinia demonstrates a commitment to keeping the marine environment clean and minimizing the negative impacts of onboard waste handling.

5 Closing

5.1 Conclusion

Based on the results and discussion of the analysis of waste handling on the MV. Coral Actinia, the author can conclude according to observations that all MV crew. Coral Actinia has understood and implemented waste handling following the Garbage Management Plan. This reflects a commitment to protecting the marine environment and complying with applicable regulations. Although the garbage handling procedures have been well implemented, the lack of garbage storage facilities on board is a major obstacle. This can lead to excessive accumulation of garbage, especially when the ship experiences delays in docking at the port. Excessive accumulation of waste on board, especially during delays in berthing at ports, can increase the risk of pollution of the

marine environment. Scattered and wind-borne garbage can fall into the sea, causing negative impacts on the marine ecosystem. The importance of investing in shipboard waste containment facilities is clear. Adequate facilities will help address the accumulation of waste and reduce the risk of environmental pollution. Thus, the conclusion emphasizes the need for greater attention to shipboard waste handling infrastructure. With proper investment in containment facilities, the MV. Coral Actinia can be more effective in keeping the marine environment clean and minimizing the negative impacts of waste handling.

5.2 Suggestion

Based on the conclusions of the previous research and discussion, the author suggests that it is necessary to provide adequate supporting facilities for handling waste on board, such as a large garbage bin. With this facility, waste handling on board can be done more efficiently and optimally. By providing adequate supporting facilities, it is hoped that excessive accumulation of waste and potential pollution of the marine environment can be avoided. The large garbage bin will help reduce the risk of garbage being scattered at sea when the ship is delayed at the port. This move also reflects a strong commitment to the protection of the marine environment. By paying more attention to the garbage handling infrastructure, MV. Coral Actinia can ensure that its operation runs following sustainable environmental principles. Thus, this suggestion is expected to help MV. Coral Actinia in improving the effectiveness of onboard waste handling and protecting the marine environment from pollution.

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